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1995-96 A Review







INDIAN ARCHAEOLOGY 1995-96
— A REVIEW

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PREFACE

This number, like previous issues contains information on various aspects of archaeology including (a) excavations, (b) explorations, (c) epigraphy, (d) numismatics, (e) palaeobotany, (f) structural/chemical conservation as well as on archaeological gardens and publications. I extend my thanks to all the contributors, and at the same time, request all heads of archaeological organizations in States, Universities, Museums and Research Institutes including our own colleagues in the Survey to adhere to the time schedule set so that future issues can be brought out timely. In editing this vast material some errors must have crept in for which I tender my apologies. However, for all information in respect of individual articles, the responsibility rests with the contributors.

In our endeavour to update the issues of IAR, I record my deep appreciation to Mr. C. Dorje (at present Superintending Archaeologist, Chandigarh Circle) and Dr (Miss) Arundhati Banerji (Dy. Superintending Archaeologist, Publication), without whose persistent and unstinted efforts it would not have been possible to bring out this issue. My thanks are also due to Mr. Umesh Kumar (Director, Publication) and Dr B.R. Mani (Superintending Archaeologist, Publication) for their co-operation. I would also like to thank Mr. Hoshiar Singh (Production Officer, Publication) for preparing dummy of plates and also to Mrs. Anju Dhawan (Assistant Archaeologist, Publication) and the other members of Publication Section. A special thank to Mr. R.C. Sardana of the Drawing Section for improving the line drawings published in this issue.

I would be failing in my duty if I do not thank Messers S. Narayan & Sons for bringing out this issue so promptly.

19th March, 2002 — Kasturi Gupta Menon

New Delhi — Director General

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ANDHRA PRADESH

1. EXPLORATION IN DISTRICT ANANTAPUR.— The explorations in the villages Ratnagiri, Kotanti, Pedatumbalam, Lakshmammagutta, Kutagulla and Chippagiri in District Anantapur, carried out by the Directorate of Archaeology and Museums, Government of Andhra Pradesh, brought to light proto and early historic habitation sites.

2. EXCAVATION AT JUJJURU, DISTRICT KRISHNA.— In continuation of the last year's *{Indian Archaeology 1994-95 — A Review,* p.I)[1] trial-dig, a small-scale excavation was taken up at Jujjuru, by the Hyderabad Circle of the Archaeological Survey of India,[2] which revealed a few structural remains built of bricks, besides terracotta figurines and pottery represented by Rouletted Ware, red ware, black-and-red ware and a few coins of Sada kings, all datable to the first century BC/AD. The surface collection at the site consists of lead coins of the Ikshvakus, beads of lapis lazuli, agate, shell, and terracotta, besides fragments of shell bangles.

3. EXPLORATION IN DISTRICT MAHABOOBNAGAR.— In the course of village-to-village survey in Makthal taluk, R. Krishnaiah, of the Hyderabad Circle of the Survey, discovered the following archaeological remains.

Site	*Nature of remains*
Chityala (16° 23' 50" N; 77° 30' 58" E)	Remains of fort; loose sculptures of Ganesa; hero-stones of late medieval period
Datanpalle (16° 37' 30" N; 77° 32' 08" E)	*Nandi* and Anjaneyasvamy Temple of medieval period
Kami (16° 26' 0" N;77° 31'6" E)	Mud-bastion of late medieval period

This publication will hereafter be referred to by the year only. [2] Archaeological Survey of India is referred to in the following pages as the Survey only.

Site	*Nature of remains*
Khanapur (16° 2' 56" N; 77° 30' 0" E)	Medieval pottery including jars, vases, bowls, etc
Kollur (16° 36' 42" N; 77° 28' 36" E)	Remains of a *mandapa;* a hero-stone; *naga-stone,* etc., of medieval period
Lachchampur (16° 24' 30" N; 77° 30' 55" E)	Remains of fort; loose sculptures of Ganesa and *nandi* of late medieval period
Makthal (16° 30' 0" N; 77° 30' 0" E)	Remains of temples; loose sculptures; *nandi* of early medieval period
Samistapur (16° 37' 33" N; 77° 28' 36" E)	Stray potsherds of medieval period

4. EXCAVATION AT PUDURU, DISTRICT NELLORE.— In continuation of the last year's work *{1994-95,* p.2), the Birla Archaeological and Cultural Research Institute (BACRI), Hyderabad, resumed excavation under Kamalakar and V.V. Krishna Sastry at Puduru. The site is spread over approximately 1 sq km, locally called Malaya Kota or Muniratnapalle. The entire area in south and west of the mound is occupied and partly disturbed by the local villagers. As per the local tradition the mound was once secured by the fort and fortifications. The longer axis of the mound is oriented north-south.

The excavation revealed a series of brick structures (pl.IA) which included a huge rectangular hall, divided into several rooms prefaced by a running verandah, huge silos for storing food grains, bathrooms, cisterns, underground drainage-system, soakage-pits, etc. A close study of the construction levels of different structures revealed four phases of construction without much time gap between each phase. The bricks utilized in different phases also vary in measurements. There were indications of reuse of bricks to repair the collapsed walls due to cyclone or flood. However, the bricks from all the phases were well-burnt, and strong enough to sustain the vagaries of nature.

There were six principal ceramic industries represented by red-slipped ware, a few sherds of Rouletted Ware; black-slipped ware, black-and-red ware; Red Polished Ware and a number of fragments of conical bottomed amphorae in coarse red fabric. Along with pottery, quite a number of perforated tile pieces and animal bone pieces were also found.

Besides pottery, coins of lead having a standing bull inside a dotted circle on the obverse and blank on the reverse, assignable to the last quarter of the second century AD; beads of semi-precious stones, glass and paste; iron implements and bone points were also recovered. The semi-precious stone beads comprised carnelian, crystal, quartz, amethyst, agate and chalcedony. Among these, quartz beads out number the rest. A large quantity of iron slags and vitreous material were also found which indicated the local manufacture of iron implements as well as glass for making beads.

5. EXPLORATION IN DISTRICT PRAKASAM.— In the course of exploration, the Directorate of Archaeology and Museums, Government of Andhra Pradesh, discovered the remains of Megalithic, early historic and medieval periods in the submersible area of Veligonda Reservoir, proposed to be constructed across the River Gundlakamma in Markapuram Mandal, District Prakasam. Also noticed were the remains of Megalithic and early historical period in the villages of Kalanutala, Gottipadia, Sunkesula, Kolabhimunipadu, Akkalacheruvu, Kakarla and Laxmipuram in the same district.

The sherds of red ware, black-and-red ware, black-polished ware were also collected from the burial-complex at Nagulavaram. The early historical material included red ware, red-slipped ware, decorated potsherds and lumps of iron ore. In addition to the above material, ten stone sculptures, such as *viragala* (hero-stones), Mahishasuramardini and *nagas,* datable to the medieval period, were also noticed.

ARUNACHAL PRADESH

6. EXCAVATION AT GOMSI (RANI), DISTRICT EAST SIANG.— The Directorate of Research, Government of Arunachal Pradesh, conducted trial-excavation at the main mound and at extreme northwestern corner of the site which comprised 11 -5 acres of land. The site (pi.IB) is located at 15 km in the southwestern direction from the district headquarter, Pasighat and 19 km inside from Murkong Salak, nearest Railwayhead in Assam-Arunachal border. A portion of brick-wall was exposed (pl.IC) out of a house structure. Excavation of almost rectangular mound (21x17 m), revealed ten brick courses to the northwestern corner of the wall showing both the base and the floor levels. Above the floor level, a superstructure was raised by using some perishable material. In all, there were thirteen different sizes and shapes of bricks, used for construction.

The excavation also revealed different types of pottery along with a few pieces of stone urn. Black painted pottery, with criss-cross design and a piece of flower vase were recovered from the digging in addition to an iron spear-head.

From the preliminary study of the findings, the site could be assignable to the early medieval period (probably pre-Ahom).

ASSAM

7. EXCAVATION AT SHRI SURJYAPAHAR, DISTRICT GOALPARA.— In continuation of the previous year's work *(1993-94, p. 9),* T. J. Baidya and A. Jha of the Guwahati Circle of the Survey, assisted by P.M. Das, B. Sinha and T. K. Srivastava, resumed excavation at Shri Surjyapahar and exposed the northwestern portion of a monastic-complex (pi. IIA), surrounded by a boundary-wall of burnt-bricks, set in mud-mortar. The east-west running northern boundary-wall (41 Oxl 10m) is preserved with sixteen extant brick courses. An entrance passage (1-25 m) was provided to this wall almost at the northeastern corner. The excavation further exposed a cell, interior of which measured 5-05x3-70 m in breadth and contained thirty-two extant brick courses. The thickness of the wall of the cell measured 0-95 m. The floor found to be paved with bricks, measured 31x17x6 cm. The northern verandah and the part of the northwestern courtyard were also exposed. The verandah was exposed upto a distance of 6-45 m from the northern wall of the cell. The bricks

used for construction of cell and walls of the verandah were found to be of four different sizes *viz.,* (i) 31x17x6 cm; (ii) 32x12x5 cm; (iii) 34x17x6 cm; and (iv) 41x20x6 cm.

The area between the entrance to this complex and the northern wall of the monastery was found to be brick-paved, the level of which was found to be higher when compared to the floor of the cell. On close examination, the complex was found to have gone through several repairs and during one such repair, the height of the whole complex was raised (0-42 m) by filling the entire original working floor with the river silt, over which a new floor was laid by using bricks at the prominent places, such as at the entrance area and brick-jelly at the remaining one. This later constructional activity also resulted into providing an extra thickness of 0-84 m from the interior. The section, though much disturbed due to later constructional activities, contained 0-23 m thick layer of silt-deposit, perhaps caused by the inundated river flowing nearby.

On the basis of main constructional activities and associated finds, the habitation site was divided into two main phases *viz.,* I and II. The ceramic industry of phase I, was represented mainly by the dominant red ware though grey ware and black ware appeared in large numbers, showing mainly the utilitarian types, such as bowls and jars with corrugated interior, *handis,* plates, etc. Some of the bowls of this phase showed marked similarity with knife-edged bowls of the Gangetic plains. On the basis of this similarity, the desertion phase of the site could be assignable to *circa* tenth-eleventh century AD.

In phase II, ceramic assemblage comprised mainly the red ware, black ware, pale red ware and grey ware, an associated ware of phase I. The shapes were of utilitarian type which included bowls, basins, dishes, jars, miniature *lota-shaped* pots and lamps. Some of the dishes with stand and jars with spouts were also encountered. Decorated pots were very few but the designs executed by stamping and hatching, comprised mainly the floral and geometrical ones. Terracotta tiles having geometric, floral and human motifs were found in large number. Some of the intricately moulded-tiles having grooves at the rear face were half cylindrical in shape.

The antiquities found from phase II comprised terracotta plaque, showing the figure of an *apsara,* standing in *tribhanga* posture and a head of Buddha within a circle. Among the stone objects mention may be made of a head of a deity (?), adorned with a *karanda-mukuta,* and broken pedestal having tenon for fixing a figure showing only the feet portion of a deity, flanked by a pair of feet on either side. On the basis of a terracotta plaque, depicting *apsara* and a head of Buddha image which betray the typical Gupta art tradition, this phase could be datable between *circa* fifth-sixth century and eighth century AD.

8. EXCAVATION AT AMBARI, DISTRICT GUWAHATI.— The Directorate of Archaeology, Government of Assam, Guwahati, under the direction of N.P. Chaudhury, in continuation of earlier work *(1968-69,* pp. 3-4; *1970-71,* p.4; *1987-88,* pp.8-9; *1988-89,* p.6; *1989-90,* pp.8-9), resumed excavation at Ambari where five trenches (6x6 m) *viz.,* AMB VII A, VI B, IV C, IV D and III R were laid.

Due to the presence of sub-soil water, the digging was done down to a depth of 218 cm and altogether nine layers were identified.

The foundation of a brick structure was found extending between AMB VII and AMB VI B in layer 7 and also a ring-well in AMB IV D, cutting across layers 3 to 9, besides a brick-floor in layer 7. Excavation yielded sherds of grey ware, kaolin and black ware.

A number of beads of semi-precious stones as well as of terracotta were recovered from different levels, as also terracotta sling-balls and a part of a stone sculpture, the identity of which could not be determined.

BIHAR

9. EXCAVATION AT MANER, DISTRICT PATNA.— The Department of Ancient Indian History and Archaeology, Patna University, in continuation of previous year's work *{1993-94,* pp.10-11), resumed excavation at Maner, under the direction of A.K. Singh and over all supervision of B.P. Roy, with the assistance of N.K. Arya, J.P. Singh and P.K. Bose.

The main objective of this year's excavation was to ascertain the cultural sequence and the extent of the pre-NBPW (Northern Black Polished Ware) settlements belonging to the Chalcolithic and Neolithic levels in the extreme southwestern side of the mound. Two trenches, each measuring 6x4 m, were laid on the southwestern side of the mound overlooking the old bed of River Sona. The trenches laid out in north-south orientation were christened as MNR-5A and MNR-5B respectively.

Excavation in this area revealed four cultural periods as against five noted earlier. Period I was represented by a thin deposit of yellowish to deep yellowish soil, i.e., layer 6 overlying the natural soil, with an average thickness of 26 cm. This is labelled as pre-NBPW which yielded black-and-red ware, with the most notable types like lipped-bowls, spouted vessels and some fragments of perforated pots in red ware.

Period II with about 2-25 m deposit, distinguished by the appearance of NBPW phase was found associated with iron and the usual NBPW shapes besides black-slipped ware. The antiquities (pi. IIB) included polished stone pestle; spear-head, nails and rod, all made of iron; terracotta female figurine, pendant, wheel, weight, sandle stick-stand with perforations and beads etc. A curious feature of this phase was a huge pit which continued down to the natural soil, sealed by layer 4 and yielded pottery types of pre-NBPW along with NBPW phase.

Period III, represented by a small brick wall of Kushan phase consisted of eight courses of bricks, laid over layer 4 and sealed by layer 3 with an average thickness of about 1 -65 m. The antiquities associated with this phase comprised iron objects, terracotta beads, etc., though the most notable find consisted of a terracotta headless female figurine (pi. IIIA).

In Period IV, a brick wall (1-30x115 m) of Gupta phase was encountered with fourteen courses of bricks. The wall sealed by layer 2 is divisible into sub-layer (2a and 2b) and the average thickness of this deposit is around 1-40 m. The antiquities (pl.IIIB) associated with this period comprised terracotta human head, animal figurine, chessman, dabber, conical object, weight, skin-rubber, reel and balls. In addition there were iron objects, stone bead and specimens of sprinklers

in polished red ware. The uppermost deposit yielded mixed material of different kinds including some fragments of green-glazed ware of early medieval period.

10. EXCAVATION AT RAMCHAURA, HAJIPUR, DISTRICT VAISHALI.— The K.P. Jayaswal Research Institute, Patna, resumed excavation at Ramchaura, under the direction of C. P. Sinha, J Pandey and Anil Kumar, with the assistance from Vijoy Kumar, S. N. Jha and B. K.Jha.

The main objective of this year's excavation was to ascertain further the cultural sequence in an area close to the Ramchaura Temple which lay towards the western side of the trench (RCH-1). One trench measuring 10x5m was laid in north-south orientation (RCH-2) almost to the north of the Ramchaura Temple.

Excavation in this area revealed 704m thick habitational deposit, divisible into two cultural periods as against the four noted in the previous excavations. In this area, Period I is represented by the NBPW deposit with a thickness of about 3-47 m. The entire deposit, divisible into three layers, ranging from layers (5 to 4a and 4), was found resting over the natural soil, composed of yellowish compact clay. The lowermost layer 5, having a thickness of 1-40 m, was composed of reddish black earth, while layer 4a characterized by blackish soil, mixed with ashy deposit, was 1 -22 m thick and the layer 4 was composed of blackish soil having a thickness 0-85 m. The ceramics obtained from these layers consisted of sherds of NBPW with varying shades and its associated wares such as black-slipped ware, grey ware, black-and-red ware and red ware. The shapes in these wares included dishes, bowls, miniature pots and a few dishes bearing floral designs. The antiquities ascribed to this period included terracotta objects such as wheels (pl.IVA), sealings, stamps, human and animal figurines (pl.IVB), ram-cart, *nagi* figurine, *ghata-shaped* beads, bangles etc., along with a few bone points, stylus, tanged arrow-heads, carnelian and ivory beads in addition to some iron objects. A terracotta ring-well consisting of twenty courses of rings with a diameter of 74 cm, found associated with the lowermost layer 5, that rests over the natural soil and sealed by layer 5.

Period II which belonged to the Kushan phase, is represented mainly by layer 3, composed of blackish soil mixed with brickbats and an average thickness of 0-86 m. The pottery from this layer included red ware showing plain and finely-slipped specimens of bowls, dishes, vase, miniature pots and a few miniature bowls. The notable antiquities associated with this phase included terracotta human (pl.IVB) and animal figurines, wheel, beads and balls, copper antimony rod and some iron objects.

The overlying layer (2a), represented by a sterile layer of sandy deposit, indicative of heavy flood, is 1 • 13 m thick.

Layer (2) is composed of reddish soil with blackish tinge and a thickness of 0-86 m; while layer (1) composed of light blackish soil is 0-44 m. Both the layers yielded mixed materials from different periods showing red ware with plain and finely-slipped specimens, black-slipped ware sherds along with a few antiquities such as fragmentary human figurines, bangle pieces, balls of terracotta and iron nails.

GOA

11. EXCAVATION AT ST. AUGUSTINE CHURCH-COMPLEX, OLD GOA, DISTRICT NORTH GOA.— In continuation of the previous year's *{1994-95,* p. 11) work, the Mini Circle, Goa, of the Survey, carried out scientific excavation at St. Augustine church-complex under the direction of Muhammed K. K assisted by V. Gopala Rao.

After removing the debris to a depth of 4 m, part of a room, adjacent to a staircase, measuring 2-70x 10-9 m, was exposed. This room extended further southwards. The exact length of this room could be determined only after the removal of debris. The proximity of this room with the main altar and the entrance linking it with the main church, points to the possibility of this hall being used as Sacristy.

The important antiquities found from the site comprised the Chinese pottery and iron nails.

GUJARAT

12. EXPLORATION IN THE BHOGAVO AND THE BHADAR VALLEYS, DISTRICTS AHMEDABAD AND SURENDRANAGAR.— In the course of village-to-village survey, K. Krishnan and Kiran Dimri of the Department of Archaeology, M.S. University of Baroda, Vadodara, brought to light the following sites (fig. 1) of archaeological interest along the Bhogavo-Bhadar and Lilka river basin in Dhandhuka and Dholka taluks, District Ahmedabad and Limbdi taluk, District Surendranagar.

Village	*Site*	*Nature of remains*
Dhandhuka taluk, District Ahmedabad		
Alampur (22500 sqm)[1]	Khojpur (71° 41' 55" E; 22° 19' 2" N)	Early historical, historical and medieval
Aniyali (40000 sqm)	Kedio no timbo (71° 54' 29" E; 22° 19' 52" N)	Harappan, early historical and medieval
Barania (22500 sqm)	Timbo (71° 49' 7" E; 22° 20'50" N)	Harappan
Bhadiad	Village on the mound (72° 10' 00"E;22° 16'48" N)	Historical
Chandarvaha (122500sqm)	(71° 51' 19" E; 22° .15' 54" N)	Harappan and historical
Chharodia (40000 sqm)	Murajpir (71° 56' 46" E; 22° 24' 43" N)	Harappan and medieval

The co-ordinates mentioned here are of the nearest village and size of the mounds/sites is approximate.

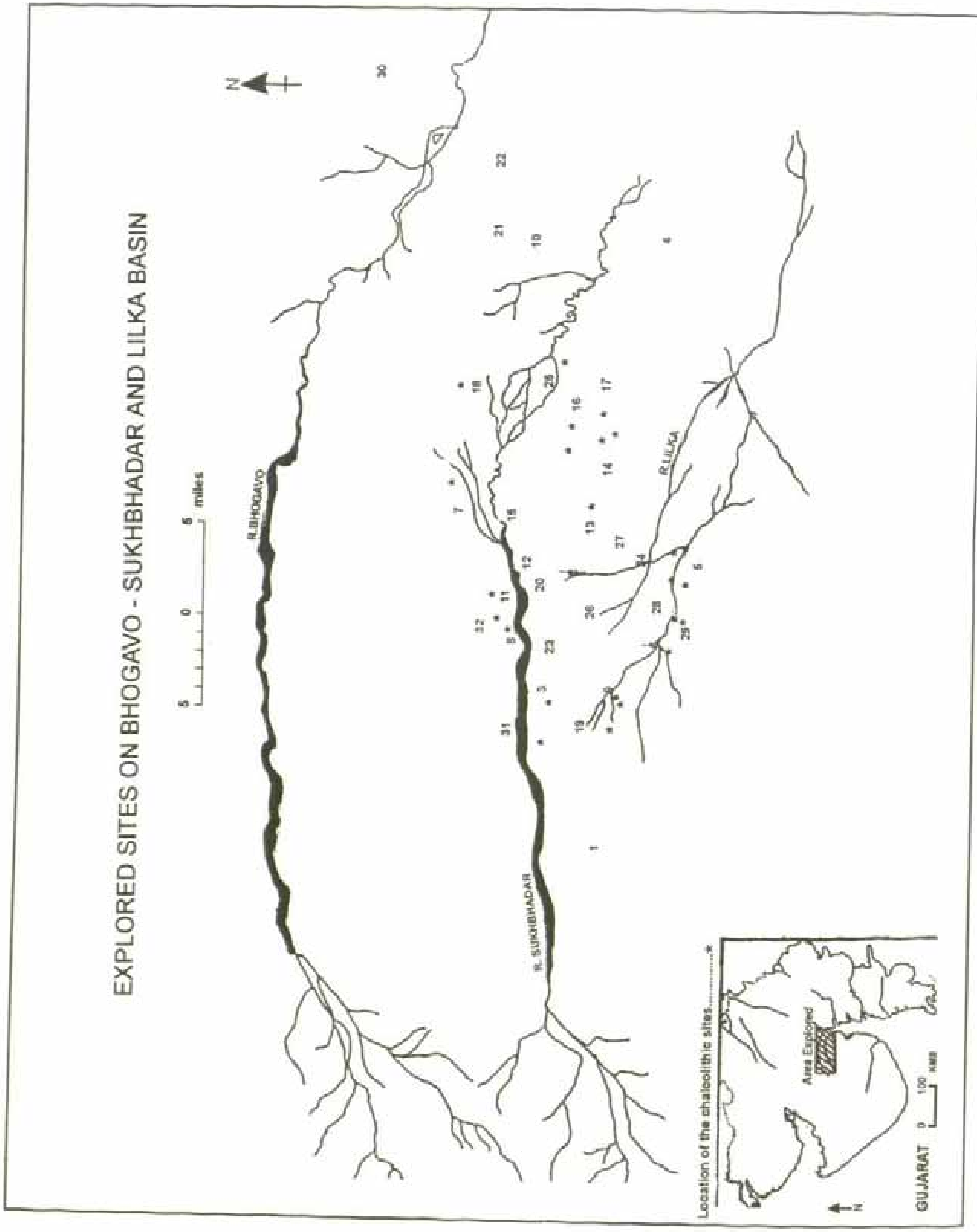

EXPLORED SITES ON BHOGAVO - SUKHBHADAR AND LILKA BASIN
miles
R.BHOGAVO
R. SUKHBHADAR
R.LILKA
Location of the chalcolithic sites
Area Explored
GUJARAT

Fig. 1

Village	*Site*	*Nature of remains*
Gamph	Village on the mound (72° 9' 7"E;22° 21' 23" N)	Historical and medieval
Golsana (40000 sqm)	Panchpir (71° 52' 39" E; 22° 22' 47" N)	Harappan and historical
Gunjar (2500 sqm)	Junigunjar (71° 55' 4" E; 22° 21' 48" N)	Historical
Jaska (30000 sqm)	Jaska (71° 56' 10" E; 22° 19' 10" N)	Harappan
Jinger (10000 sqm)	Jinger (71° 59' 7" E; 22° 17' 59" N)	Harappan
Kotada (30000 sqm)	Kotadio (71° 56' 28" E; 22° 22' 46" N)	Early historical and medieval
-do- (15000 sqm)	Podio Sand	Historical
Kotariyo (22500 sq m)	Pingu no Timbo I (72° 0' 35" E; 22° 19' 52" N)	Harappan and early historical
-do- (15000 sqm)	Timbo II	Harappan
Kharad (40000 sq m)	Vikram bhai no timbo (72° 1' 2" E; 22° 18' 20" N)	Harappan
-do- (50000 sq m)	Juru bhai	Harappan
-do- (50000 sq m)	Juru bhai no timbo	Harappan
-do- (2500 sq m)	Limdio no-khetar	Harappan, early historical and medieval
-do- (2000 sq m)	Moriyo no-timbo	Early historical and medieval
Khadol	Village on the mound (72° 2' 39"E;22° 24' 18" N)	Historical

Village	*Site*	*Nature of remains*
Khadol (10000 sqm)	Shankar Mandir	Harappan
Papli (2500 sq m)	Papli 72° 13' 58" E; 22° 23' 45" N)	Historical
Patana (30000 sqm)	Village on the mound (71° 49' 51" E; 22° 21' 32" N)	Early historical
Pipal (22500sqm)	Ayar no-nashado (71° 54' 16" E; 22° 16' 40" N)	Historical
Tagadi	Village on the mound (71° 56' 46" E; 22° 17' 37" N)	Historical
Unchadi (45000 sqm)	Ghanda bhai no khatar (71 ° 53' 14" E; 22° 16' 40" N)	Harappan and early historical
Vejalka (10000 sqm)	Neshadho I (71 ° 52' 12" E; 22° 15' 00" N)	Historical
-do- (37500 sq m)	Neshadho II	Harappan
-do- (25000 sq m)	Neshadho III	Harappan
Dholka taluk, Distict Ahmedabad		
Naniboru (2000 sq m)	Naniboru (72° 18' 20" E; 22° 26' 40" N)	Medieval brick temple
Limbdi taluk, District Surendranagar		
Nagnesh (22500 sqm)	Sheikhpur (71° 45' 53" E; 22° 21' 57" N)	Harappan
-do- (22500 sq m)	Nana saparka	Historical and medieval
Sontha (62500 sqm)	Sontha (71° 51' 10" E; 22° 23' 7" N)	Harappan and historical

13. EXCAVATION AT PADRI, DISTRICT BHAVNAGAR.— Vasant Shinde, assisted by S. Pradhan, K. Malap, P. Deodhar, S. Bhagat-Kar, K. Dalai, B. Tripathy, J. Kharakwal, R. Mitra and P. Sankalia of the Deccan College Post-graduate and Research Institute, Pune, resumed excavation after a gap of one season with a view to studying the early Harappan phase. The excavation was confined to the central part of the habitation in an area of 12-5xl2-5m where the upper deposit was exposed in the previous seasons. Besides, three localities on the eastern and southern periphery of the mound were chosen for carrying out environmental studies.

During the course of excavation two pottery kilns were discovered, one while digging a test pit near the southern periphery of the mound and the other 50 m to the north of the main excavation area. The kiln found near the southern periphery was apsidal on plan with its longer axis running in east-west direction (pl.VA), which was 2-20 m long and 1-34 m wide. The extant height of the mud-wall of the kiln was 80 cm. A number of conical clay stumps with arches were found inside the kiln, perhaps used as a part of the flues for letting out the gases from the kiln. The lower part of the kiln is well preserved. In front of the kiln was found a globular Harappan storage-jar of the sturdy red ware, with a flat base.

The other kiln on the northern side of the main excavation area, circular in shape with a maximum diameter of 110 m was an accidental discovery. It was noticed in an area being dug by the villagers for obtaining habitation soil for construction. The kiln was, therefore, partially damaged on its eastern side. A small passage, 65 cm wide, has been provided on its eastern side, which was found damaged. This passage might have served as a fire chamber for the kiln. The kiln has survived to a height of 95 cm (pl.VB).

Both the kilns found *in situ* have thick mud-walls, which were burnt red due to their constant use. Inside the kilns were found vitrified potsherds and heaps of ash. It appears that cow-dung was used for firing pottery inside the kiln. Both the kilns were lined from inside with a thick coating of *kankar* and sand. These might have been intentionally added to the clay as both were needed to raise the temperature gradually to 750° centigrade as also to maintain it for a longer period. From the context these appeared to belong to the Harappan period.

In the main excavation area, two structures were excavated in the early Harappan levels. Both the structures could be placed earlier than the Structure-complex 14, exposed in previous season. Structure 15, represented by a very well-made floor, was located on the eastern side of the main excavation area. It was exposed in an area of 730 mx4-30 m. Almost in the central portion of the structure was a small rectangular fire-place. A number of post-holes on the western periphery of the floor and also inside were found (pl.VC). This structure was probably occupied by people of many generations as at least four different floor levels have been encountered. This structure might have been occupied by a lapidary as it yielded beads of semi-precious stones in various stages of manufacture and a bead polisher (pl.VD). A large number of coix seeds were found on the floor of this structure.

The Structure (16) was found immediately to the north of Structure (15) which was rectangular on plan with a partition dividing it into two compartments. Except the eastern, the

remaining three walls have been exposed. The walls were made of black clay, the average thickness of which was 30 cm. The structure, 3-80 m broad (north-south), was exposed to a length of 5-50 m (east-west). It extended further into the eastern section which remained unexposed. This appeared to be a dwelling structure as it yielded a saddle quern besides a couple of grinding stones. Considering the remains of structures, the early Harappan phase appears to be rich as compared to the mature phase at the site. Atleast two structural phases have been excavated so far in this phase. The structures in the upper levels were very large, complex and made of mud-bricks, compared to the mud structures found in the lower levels of the same phase.

A large number of micro steatite beads and a copper razor were found in the early Harappan levels. The painted ceramic assemblage found in the early Harappan levels is slightly coarse in fabric and treated with a thick coating of red colour. A detailed study of the ceramic revealed a gradual evolution in the ascending order. Towards the end of the phase the same ceramic is transformed into the sturdy Harappan red ware.

A number of test pits dug by Deodhar, revealed that the backwater of the sea, and the course of River Shatrunji were closer to the site. At present, the River Shatrunji flows roughly 6 km away from the site. However, the observations almost conclusively suggest that the site was on the bank of the river. It is not unlikely that the shallow water of the sea, which was closer to the site, was exploited for salt farming by the Harappans.

14. EXPLORATION IN DISTRICT KACHCHH.— B. R. Meena, assisted by Y. S. Rawat, V. H. Parmar and K. R. Malviya of the Vadodara Circle of the Survey, carried out exploration in District Kachchh in continuation of previous work {*1985-86,* pp. 17-19; *1986-87,* p. 29). Seventy-one villages in Anjar, Bhuj, Mundra and Rapar taluks were surveyed and twenty-three sites bearing antiquarian remains ranging from protohistoric to late medieval period were brought to light (figs.2-4). The sites of archaeological interest with their cultural assemblage are listed as under:

Taluk	*Village*	*Site*	*Nature of remains*
Anjar	Ambapar	Pardoda	Medieval
-do-	Chandroda	Chandroda	Late medieval and memorial stones
-do-	Loharia	Juna Loharia	Late medieval and memorial stones
-do-	Lakhapar	Kothawala	Medieval
-do-	Naga Waladia	Naga Waladia	Medieval and memorial stones
-do-	Rapar	Khandoria	Medieval
-do-	Ratta Talav	Ghaludi Bhatt	Medieval and memorial stones
-do-	Waladia Bita	Kuba/Mora	Medieval

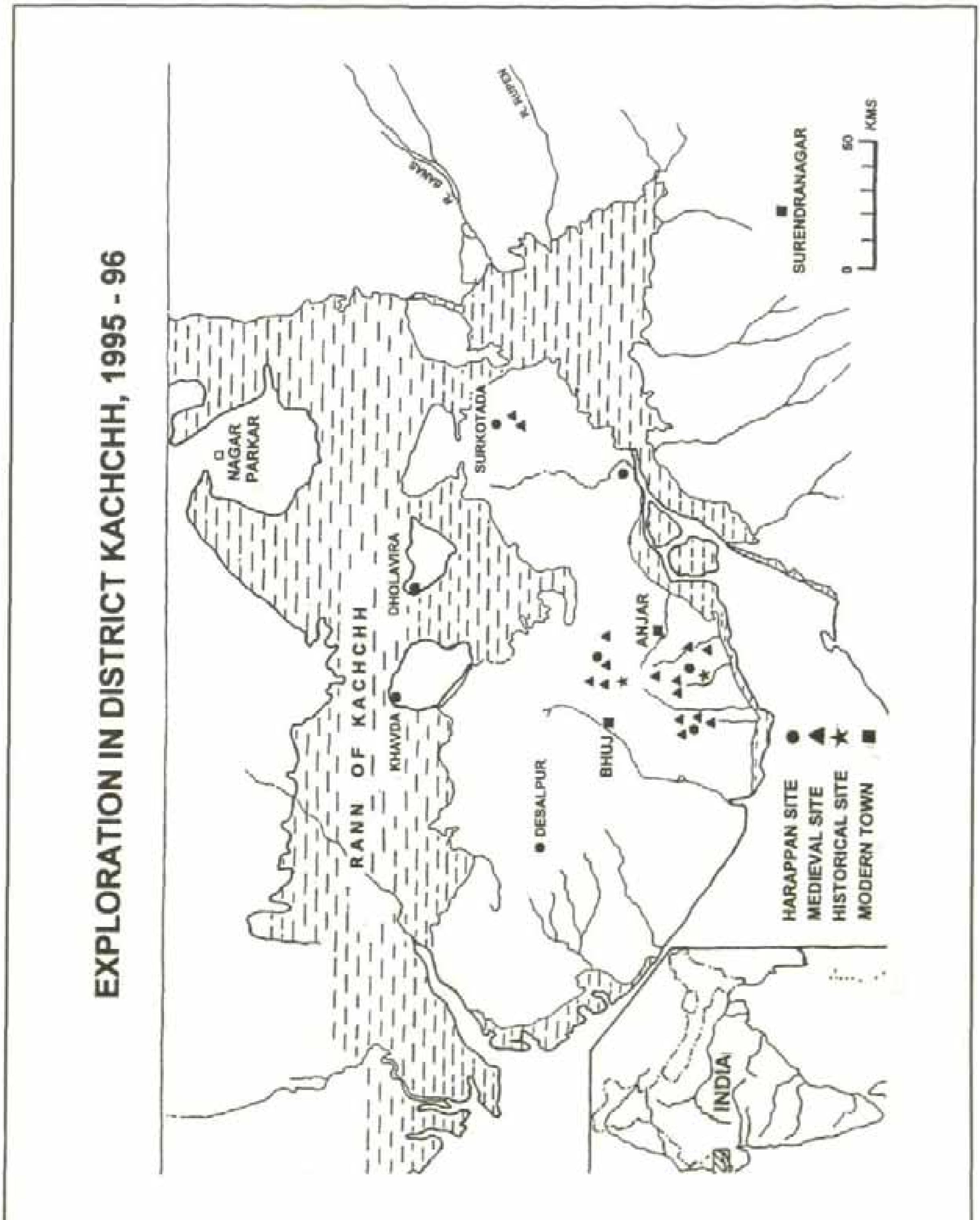

EXPLORATION IN DISTRICT KACHCHH, 1995 - 96
NAGAR PARKAR
RANN OF KACHCHH
KHAVDA
DHOLAVIRA
SURKOTADA
DESALPUR
BHUJ
ANJAR
SURENDRANAGAR
0
50
KMS
HARAPPAN SITE
MEDIEVAL SITE
HISTORICAL SITE
MODERN TOWN
INDIA

Fig. 2

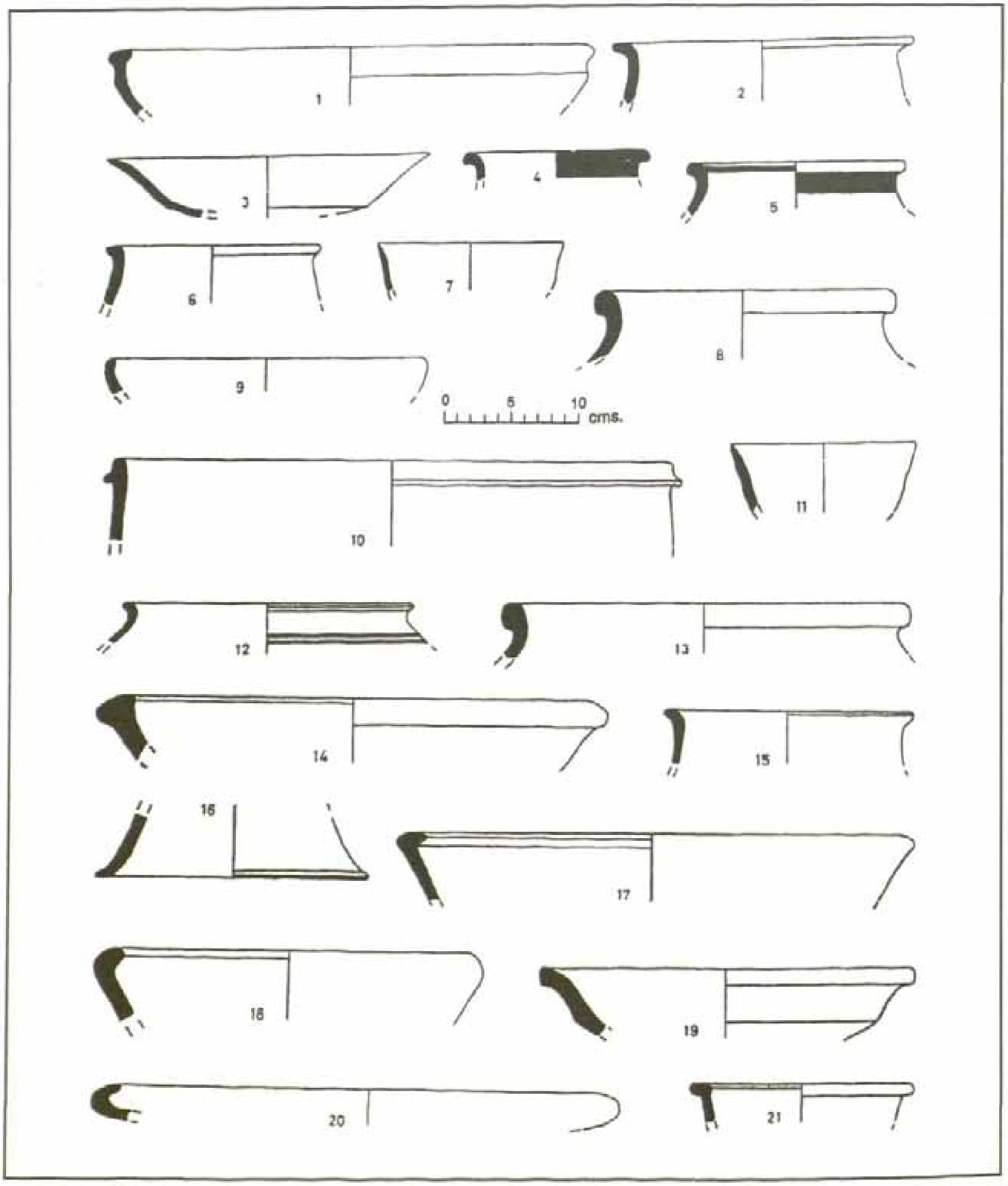


Fig. 3. *Kachchh : Harappan pottery types*

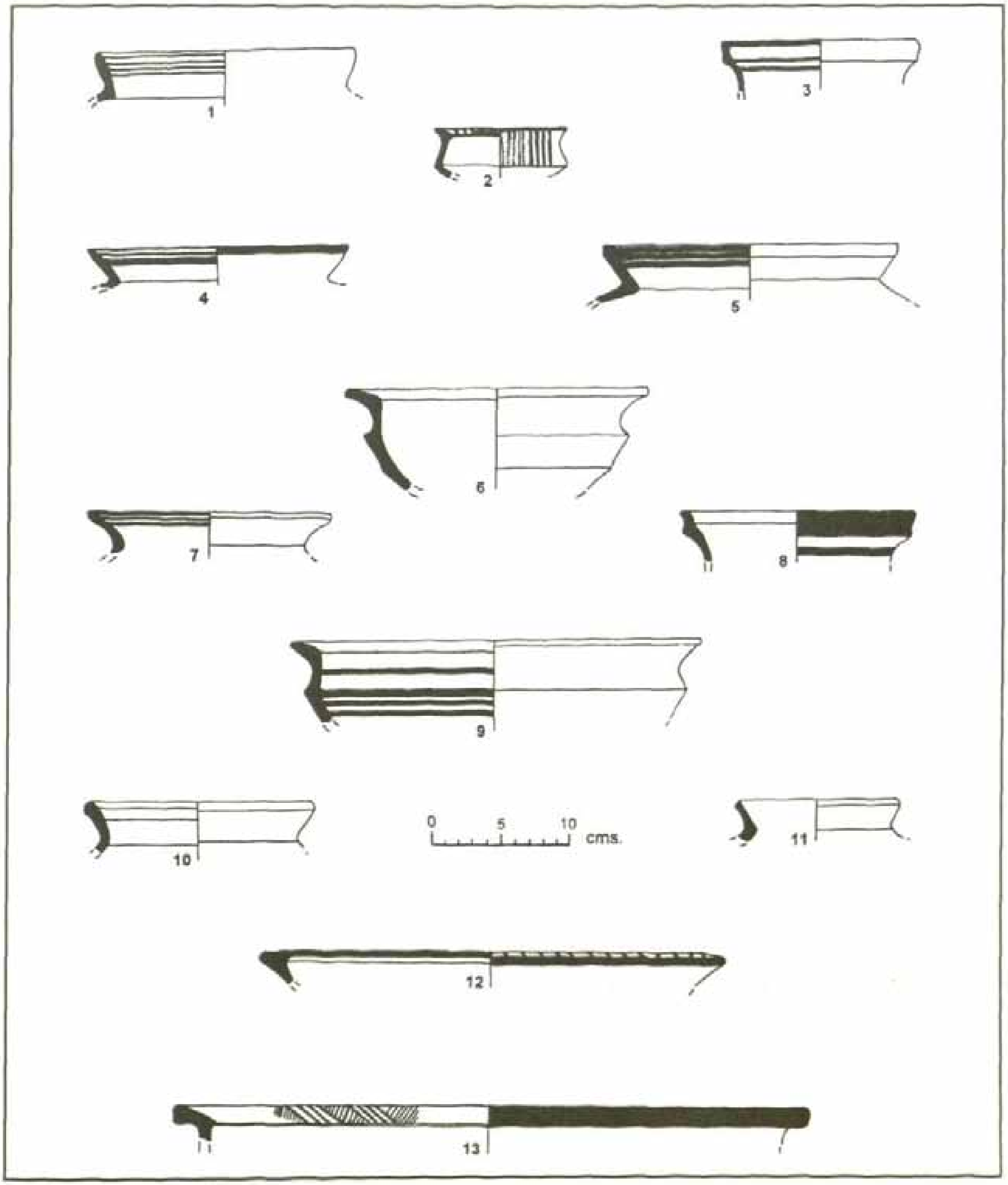


Fig. 4. *Kachchh : pottery of historical period*

Taluk	*Village*	*Site*	*Nature of remains*
Anjar	Vira	Harsidhi Mata	Temple and sculptures of sixteenth century
Bhuj	Chapreli	Chapreli	Memorial stones of seventeenth-eighteenth century
-do-	Dhaneli	RoziMata	Harappan
-do-	Kali Talawadi	Ukedo	Medieval
-do-	Mamuara	Ukedo	Medieval
-do-	MotiReladi	KandaBeti	Historical
Mundra	Bagada	Ajor	Medieval
-do-	Baraia	Moyada	Medieval
-do-	Bharudia	Bharudia	Late medieval and memorial stones
-do-	Chasra	Moro	Harappan
-do-	Kanjhara	Khandario	Medieval and memorial stones
-do-	Lakhapar	Dhruyo	Late medieval
-do-	Mokha	Ajorio-Dharai	Medieval
-do-	Tapar	JunaTapar	Medieval
-do-	Wadala	Khadaka	Harappan
Rapar	Bhutokiya	Paria Waridhar	Late medieval
-do-	Bhutokiya	Savalakha	Medieval

15. EXCAVATION AT BAGASRA, DISTRICT RAJKOT.— V. H. Sonawane, V. S. Parekh, P. Ajithprasad, K. K. Bhan, P. C. Choudhari and Abhijit Majumdar of the Department of Archaeology, M. S. University of Baroda, Vadodara, conducted excavation at Bagasra (23° 3'N; 70° 37'E) in Maliya taluk. The site was first reported in a joint exploration by the Deccan College, Pune and the Department of Archaeology, Government of Gujarat. Excavation revealed several interesting aspects of a fortified settlement belonging to the Mature/Urbane phase of the Harappa culture.

The site, locally known as Gola Dhora, located about half a kilometre south-east of Bagasra village, is hardly a kilometre away from the southeastern shore of the Gulf of Kachchh. Gola Dhora is a large rectangular mound measuring approximately 2 hectares (160x120 m) with a maximum

height of 7-50 m from the surrounding plain fields. The highest part of the mound at the southeastern side is a small squarish area measuring 12x10 m. Extending from this highest part, on its northwestern side is a large open area measuring approximately 48x32 m. It slopes down towards the north-west to a minimum height of 5-00 m. The southern side of the mound gently slopes down from the above elevated part to a distance of 75-00 m before it merges with the surrounding agricultural field. The height at this part of the mound, varies from 500 m to 1 00 m. On the other hand the northeastern side is very steep all along the longer axis of the mound probably due to a surviving periphery wall concealed below at this side.

Five trenches (5x5 m) were laid at carefully selected areas at the site with a view to establishing the stratigraphic sequence of the deposit as also for ascertaining the existence of the periphery wall. Among these, four trenches, DO6, DO7, DO8, and EK5 were taken up at the northeastern periphery while the fifth one, i.e., EQ3 was almost at the centre of the mound.

Although a 4-30 m habitation deposit was exposed at the site, the natural soil however, could not be reached, which seemed to be about 100 m further down.

The entire deposit belonged to the Harappa culture, which constituted fifteen distinct layers belonging to three different phases of culture. The early phase (phase 1) at the site, layers 15 to 8, represented by a substantial deposit of several well prepared clay floors about 1-30 m thick. As the excavation was confined to a small area, the exact nature of this early phase of Harappan occupation at the site could not be ascertained. The phase II, represented by layers 7 to 4 with a thickness of about 1-50 m, indicated an economic well being of the society. While the last phase, i.e., phase III at the site, about 1-50 m deposit, formed by the layers 3 to 1, marked the gradual decline in economy at the site.

The remains of mud-brick structures and habitation floors were traced in all the trenches, most of which belonged to the phases II and III. However, a series of well plastered mud-floors belonging to the phase III were found in Trench DO7. At the northern periphery of the settlement, in Trenches DO6 and DO7, were traced the remains of a large periphery/fortification wall aligned in the east-west direction. This wall belonged to phase II. The inner side of which was exposed in Trench DO6. The actual width of the wall couLi not be ascertained as it's outer-face extended beyond the limits of the trench. One of the offsets of this wall exposed in Trench DO7, showed nine regular courses of bricks with an extant height of 1 00 m. On the other hand, Trench EQ3 at the centre of the mound, revealed a large mud-brick structure just below the surface deposit. It appeared that this structure built in phase II was continued to be used in phase III also. Since it extended beyond the trench at all sides, it was not sure if this was part of a platform or a large wall. Generally bricks of three different colours dark grey, light yellow, ashy grey, with varying compactness were used in the construction of these structures. Although the bricks conform to the standard 1:2:4 ratio, they were primarily of two different sizes *viz.,* 46x23x11-5 cm and 36x18x9 cm.

Besides a number of Harappan pottery, a variety of artefacts including an inscribed terracotta sealing, shell bangles and ladles, beads of semi-precious stones like carnelian, agate, amazonite

and lapis lazuli, faience beads and bangles, cubical weight of chert, stone pendants or gamesmen, terracotta toys, beads and animal figurines etc., were recovered.

Three distinct types of pottery were identified. These comprised Mature/Urban Harappan pottery represented by its characteristic shapes, decoration and technique of production; the "Sorath Harappan" or the pottery generally associated with most of the Harappan sites in Saurashtra and a few sherds of the regional Chalcolithic pottery (Anarta pottery) of north Gujarat.

Although the relative abundance of the ceramics varied in different layers, the Mature/Urban Harappan pottery was found all through the deposit. These represented mainly the dish-on-stand with or without incised decoration, tall perforated jars, narrow pedestalled vases/goblets, beakers, large S-shaped jars with characteristic paintings, large jars and basins with cord impression etc. (figs. 5; 6:1,2,8-13 and 7:9-15). Another important pottery found from the site comprised a number of sherds of black-slipped jar belonging to phase II. One of these consisted of a large graffiti-marked sherd from the rim portion. Black-slipped jars were perhaps used as vessels for transportation and a number of such vessels have been reported from the Chalcolithic sites in Oman datable to the second half of the third millennium BC.

The other two, the Sorath Harappan and the Anarta pottery were found only in small quantity. While the Anarta pottery was in existence right from the early level onwards, the Sorath Harappan pottery was found only in the late phase of habitation. The latter was generally represented by the typical bowls, medium-sized jars and pots, dish-on-stand in Harappan red ware and a few sherds of black-and-red ware and a single sherd of the stud-handled bowl (figs. 6:14-15;7:1-5), analogous to the pottery reported from Rangpur, Period IIA-B and Rojdi IA-B. On the other hand the Anarta pottery was represented by bowls, large basins and medium-sized jars with a constricted, elongated neck in gritty red ware (figs.6:3-7; 7:6-7)). Some of these were decorated with a white pigment in addition to the usual black and reddish brown pigment.

One of the important artefacts found in excavation was an inscribed terracotta sealing (pl.VIA) bearing three stamped impressions of a square seal measuring 2-28x2-28cm. The seal contained five inscribed Harappan characters at the top and a stylized unicorn figure below it. There was also a faint representation of a standard-like device in front of the animal. A few more terracotta lumps with similar stamped impressions were recovered in the excavation. However, the inscription and the motifs on them were not very clear. In addition, some of the incised and painted graffiti on pottery incorporate the Harappan scripts.

Three major economic activities carried out at the site by the Harappan inhabitants were the production of pottery as also the ornamental pieces like bangles and beads of shell and faience. The shell items included bangles, inlay pieces, pendants and ladles (pl.VIB). Shells of four marine gastropods Turbinella pyrum, Chicoreous ramosus, Fasciolaria trapezium and Lambis sp.— were the raw materials used in their production. The extensive debitage of shell working and a large number of shell bangles at various stages of their production that have been found in the excavation indicated the importance of this industry in the economic set up of the community. Another item

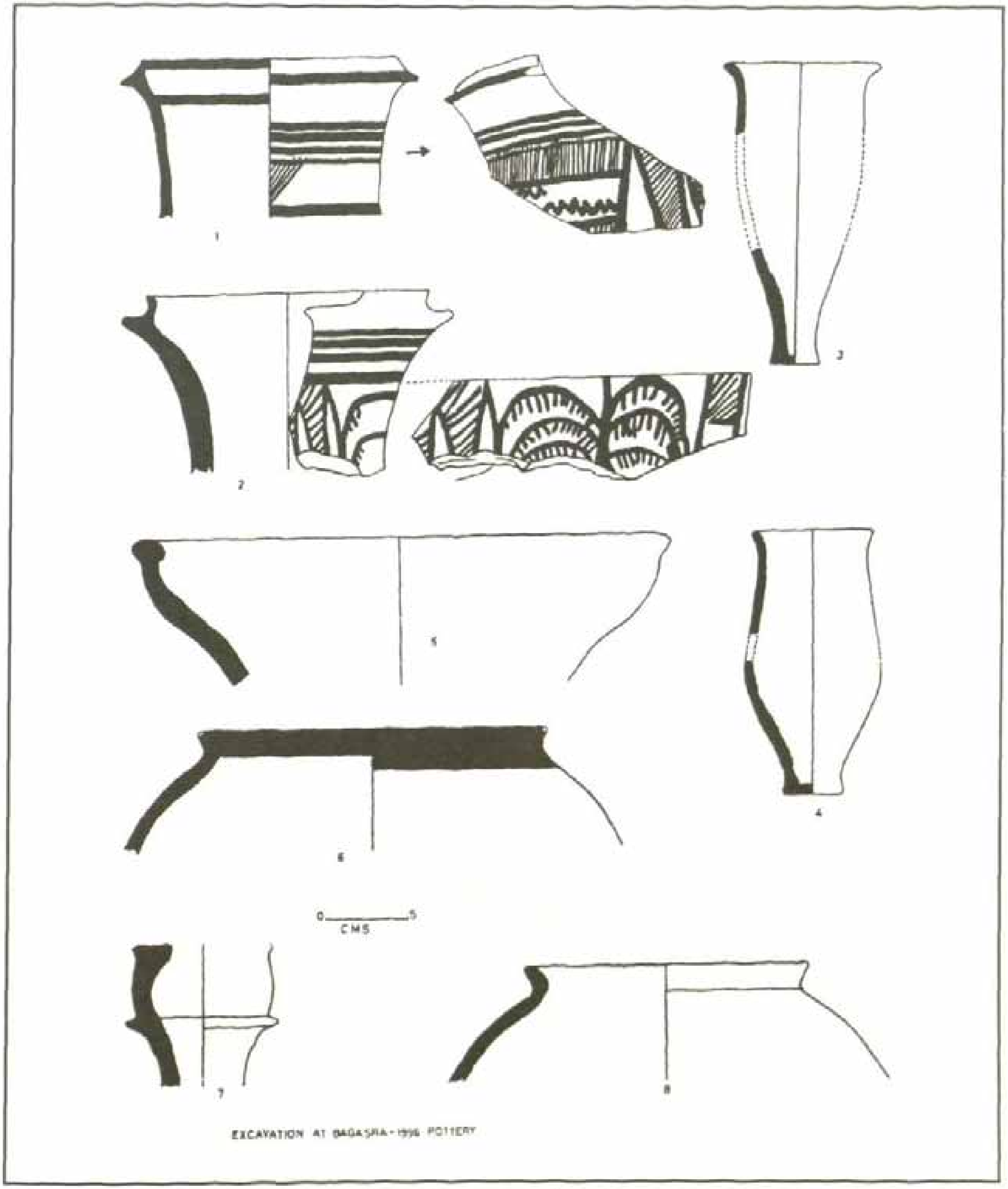


Fig. 5. *Bagasra : pottery types*

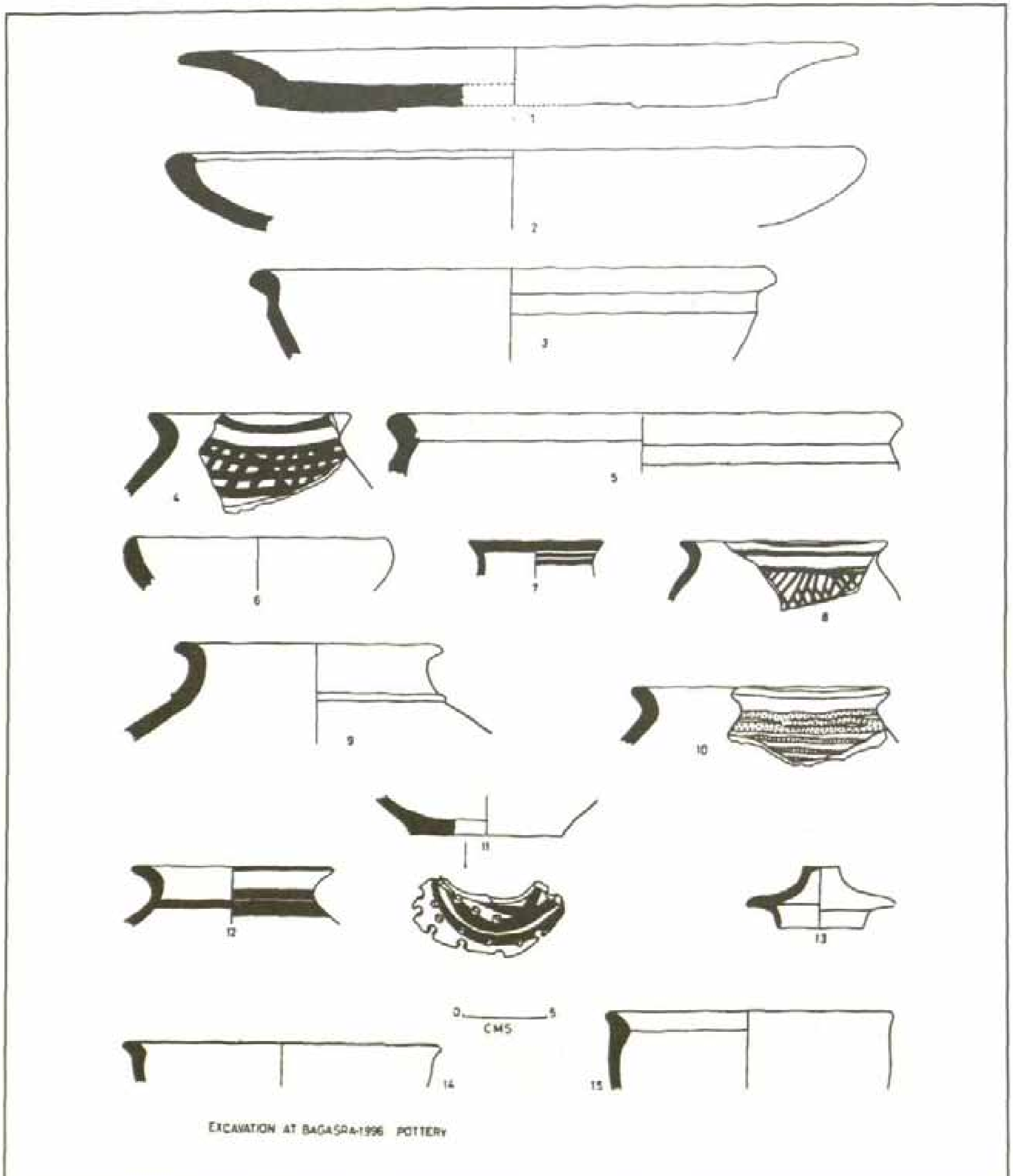


Fig. 6. *Bagasra : pottery types*

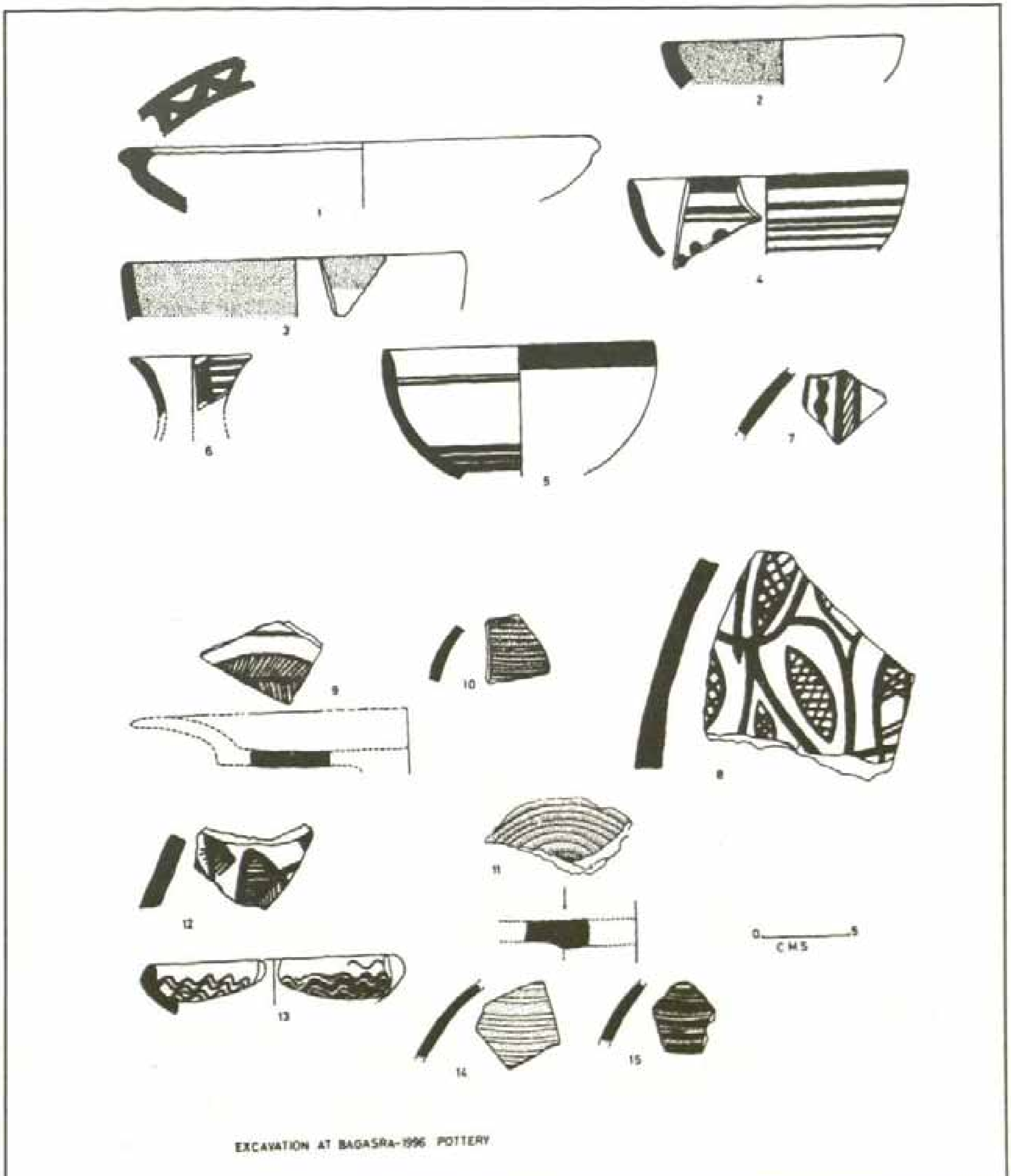


Fig. 7. *Bagasra: pottery types*

equally important in the economic set up was the faience products which comprised a large number of tubular faience beads and thick bangles with delicately incised decoration. These well finished products with wasters of faience industry were indicators of the faience items produced at the site itself.

In addition to these, a number of well produced beads of carnelian, amazonite, lapis lazuli, agate and steatite were also recovered. The steatite beads collected from the site included the large wafer-thin disc beads, small tubular beads and micro-beads. That some of these beads were fashioned at the site itself was indicated by the recovery of two semi-cylindrical micro-drill bits. A small unpolished cubical chert weight and two well polished gamesmen/pendants made of black jasper were also found. Among the stone objects found in excavation, mention may be made of a number of ribbon blades of Sukur-Rohri chert and an equally large number of backed blades and trapeziums made on fine micro-blades of moss-agate and locally available chert and jasper.

Among the objects made of terracotta, notable ones were the toys including cart-frames, wheels, tops and painted heads of animal (bull ?) figurines with a hollow body besides, spindle whorls, a triangular pyramidal object (weight ?), elongated beads and spacer beads.

Skeletal remains of the domestic and wild animals exploited by the Harappans at the site indicated a very interesting aspect about the subsistence economy of the inhabitants marked by the extensive exploitation of marine/aquatic fauna. These included a variety of large marine fish represented by the remains of vertebrae, otoliths, etc. Other items exploited at the site were aquatic arthropods like lobsters and crabs besides a variety of calms and other edible bivalves belonging to the mollusk family. A number of light fraction samples were also collected after floatation of carefully selected samples with a view to procuring floral remains. Besides, soil samples collected from different layers were being analyzed for understanding the agents and environment of deposition and the nature of each deposit.

HARYANA

16. EXPLORATION IN DISTRICT BHIWANI.— Yasvir Singh of JVMGRR College, Charkhi Dadri, under the supervision of Man Mohan Kumar of M D University, Rohtak, during the course of his exploration in Charkhi Dadri, Block I, District Bhiwani,discovered the following sites of archaeological importance with sequence ranging from the pre-Harappan to the late medieval periods.

Site	*Nature of remains*
Achina I	Late Harappan
Achin II	Pre-Harappan, Harappan and late Harappan
Bhageshvari	Historical
Bhagwi	Medieval

Site	*Nature of remains*
Dhani Phogat	Medieval
Gothada I	Medieval
Gothada II	Medieval
Hindol	Pre-Harrapan, Harappan, late Harappan and historical
Jhinjjar	Pre Harappan, late Harappan and historical
Kaopori	Early medieval and medieval
Kolhawas I	Medieval
Kolhawas II	Late medieval
Lamba	Medieval
Loharwara	Medieval
Makdana	Medieval
Makdani	Medieval
Mahrana	Historical and medieval
Mirch	Late Harappan and historical
Misri	Harappan, late Harappan
Morwala I	Pre-Harappan, late Harappan and historical
Morwala II	Medieval
Nimdi	Historical and late medieval
Neemli	Early medieval and medieval
Patuwas I	Medieval
Patuwas II	Historical and medieval
Rankoli	Medieval
Ranila	Early medieval

Site	*Nature of remains*
Sanjarwas	Medieval
Santor I	Historical and Yaudheya coins
Santor II	Medieval
Santoshpura	Historical and medieval
Sarupgarh	Medieval
Soaf Kasani	Late Harappan (Bara type)
Tikan I	Medieval
Tikan II	Medieval
Tikan HI	Historical and medieval

17. EXCAVATION AT KUNAL, DISTRICT HISSAR.— In continuation of the last year's work *(1994-95,* pp. 26-27), J. S. Khatri and M. Acharya assisted by R. S. Dahiya and Kali Ram of the Department of Archaeology and Museums, Government of Haryana, resumed excavation at Kunal (29°30'N; 7°41'E), with a view to determining the nature and purpose of water-channel around the pre-Harappan habitation, partly exposed last year, besides ascertaining more details about Period IB

To obtain the first objective, some new trenches were laid on the northern side, besides reopening a few trenches excavated last year. As a result of this operation, a circular water-channel was exposed along with the interval in-between at four cardinal directions in the periphery of the mound. From the availability of Painted Grey Ware (PGW) and associated black-and-red ware sherds in the water-channel, it appeared to be of the PGW level.

Two Trenches XA2 and XA3 were taken up for excavation. Qds I and IV of XA2 and XA3 respectively, yielded a circular structure each in Period IB, which were partially exposed. While the circular Structure IV (XA2,Qd IV) contained three mud-brick courses, built by cutting two layers 8 and 9, the circular Structure V (XA3) comprised five mud-brick courses with its working level in layer 7. There was however, no change in the type of antiquities and pottery.

Excavation in Trench WC 2, Qd III, yielded a dwelling-pit (dia 2-40m; depth 1 -50m), which was cut through layers 5 and 6. The layer 6 is composed of same red *kankar* clay. Fire activities inside the pit and plaster with a fine clay mixed with whitish material further justified its use as dwelling-pit. From this pit were recovered a number of bone knives, points and terracotta bangle pieces with paintings in black. Another important discovery from the pit comprised a small ring-stone of Neolithic tradition.

18. EXCAVATION AT SUGH, DISTRICT YAMUNANAGAR.— Excavation at Sugh (Amadalpur) (30-9' N; 77-23' E), was conducted under the direction of D.S. Malik and M. Acharya, assisted by Raniver Singh, Ashok Kumar, Vedpal Singh and Darbar Singh of the Department of Archaeology and Museums, Government of Haryana.

Situated about 5 km east of Jagadhari, the tehsil headquarter of District Yamunanagar, presently the site lies within the jurisdiction of Amadalpur village. From the frequent occurrence of ancient name Shugha in various ancient texts it may be presumed that the site was an important place throughout the ancient times.

The site was subjected to limited excavation and section scraping of a rain-gully which revealed only two cultural periods. The cultural deposit of Period I comprised greyish ash mixed with earth and a large number of potsherds lying on the natural soil. It is characterized by the occurrence of wheel-made and coarse variety of plain grey ware, black-slipped ware and black polished ware generally associated with NBPW of Gangetic valley. Only two sherds of NBPW in steel grey and black colours were recovered, while shapes in other wares included bowls and carinated *handi.*

Though two ring-wells (dia 70 cm) consisting of a few rings, placed one above the other were encountered from the lowest level, no structural remains could be traced in this period. The notable antiquities of this period were terracotta animal figurines, hand-made female figurines, beads of semi-precious stones, glass and terracotta apart from a few copper objects. This period could be datable between *circa* fifth and first century BC.

Period II of the site was marked by the occurrence of early historic red ware, stamped pottery and terracotta objects of Sunga-Kushan times. There was however, absence of NBPW and its associated wares. In Period II, houses were constructed of mud-bricks and burnt-bricks. One mud-brick structure of five courses and two baked-brick (38x23x8 cms) structures of eleven and two courses were noticed in two different quadrants. A large number of terracotta objects including the human and animal figurines, both moulded and hand-made have been recovered. Female figurines were characterized by the Sunga features, such as, heavy ornamentation, transparent drapery and shallow relief. A plaque, with upper portion missing depicting a child learning the alphabets on a wooden plate, is noteworthy. Kushan terracotta art was also in its exhuberance during this period. The human figurines were generally mould-made while those of animals were hand-made. The female figurines however, were more popular than the male forms with rich ornamentation, drapery and exquisite hair style. Among the toys, the most noteworthy finds comprised elephant, bull, horse, disc, cart-wheel, balls, marbles, etc. The ornaments recovered from the site included beads of jasper, carnelian, agate, terracotta and glass. On the basis of these finds, this period could be datable between first century BC and third century AD.

KARNATAKA

19. EXCAVATION AT HAMPI, DISTRICT BELLARY.— In continuation of the previous year's work *(1994-95,* pp. 28-32), K. P. Poonacha, of the Bangalore Circle of the Survey, assisted by T. M. Keshava, T. P. Balakrishna Unnithan and Meghraj M. Hadpad, resumed excavations at Hampi.

The excavation carried out in an area of 3000 sq m to the north of Mint, identified as the Palace-complex of Vira Harihara, yielded the following structural units pertaining to the complex (a) an imposing entrance to the entire complex at east; (b) a spacious courtyard; (c) a royal garden with well-laid flower beds in the north-east corner of the paved courtyard around the royal residence; (d) an elaborate water-channel system feeding the garden and running all along the northern screen-wall of the royal residence and other accessory structures.

Eastern main entrance, the most imposing entrance (pl.VII) of the entire complex, appears to have been built slightly later than the palace-complex, perhaps during the time of expansion of the same. In plan the entrance is having a wide passage, wide enough, even to allow an elephant to pass through. This passage has two equal wings of plinth units for guard rooms. The passage measures 2-80 m in width and has a length of 11-25 m. Each wing of the entrance measures 11 -25x8-75 m and the plinth has the traditional mouldings of *apada,* austere *adhokumuda, pattika, kantha* and an *adhokumuda* with plain *kudu* motifs. At a distance of 5-75 m in the passage, is a provision for a heavy door, with a sill width of 0-50 m. The entrance at present stands to a height of 1 -40 m. Each wing has two rectangular rooms with an entrance of 0-80 m in-between; each measuring 6-30x2-40 m. Each wing has twelve pillars. The northern wing of this entrance plinth has the main north-south running fortification wall abutting it.

The excavation carried out immediately to the west of the above *mahadvara* has laid bare a huge spacious courtyard measuring 54-40x21 -95 m. In the northeastern corner of the courtyard abutting the cyclopean fort-wall is a huge platform with a flight of steps measuring 11 x8-75 m. The platform at south is provided with a flight of steps of 2 1 8 m width and a height of 4-85 m. This platform identified hitherto as guard's platform, henceforth is identified as elephant alighting platform. To the north of this platform is an uncoursed rubble-built structure measuring 14x7-60 m and is divided into two rooms of 6-25x4-20 m with a verandah towards west. The extant rubble walls of this structure stands to a height of 0-20x0-40 m. Traces of lime plastering of the walls are encountered and the structure is disturbed. This structure is identified as Waterman's quarters because of the huge water-channel running almost to the entire length of the courtyard over to 35 m passes close to the above structure at south and passes through-en-through the massive north-south running eastern screen-wall of the Royal Residence. It is interesting to note that an iron built valve of control is set inside the water-channel below the screen-wall which might have been regulated for the flow of water to the complex. The huge water-channel is disturbed almost throughout its length save the floor stones of the channel at places and sometimes along with side walls.

The excavation in Royal Garden, conducted in an area of 2-40 sq m, has laid bare a series of circular lime-plastered basins (flower beds, thirty-two in number including the disturbed ones), inter-connected by capillary channels, which in turn are connected to a major water-channel drawn as a water source for the Royal Residence and the accessory structures of the palace-complex. This system has been identified as 'Royal Garden' which is in a fairly well-preserved condition (pl.VIII).

After complete exposure of the garden, a water-channel has been found passing below the north-south running screen-wall to the north of the Royal Residence. It takes a slight turn towards south-west

and runs farther in east-west orientation along the earlier described wall to a distance of 45-35 m and it is still continuing towards west.

The garden occupies the north-east corner of the Royal Residence spread over an area of 24-50x20-50 m. The main water-channel running to a distance of 45-35 m has an average depth of 0-35 m and a width of 0-22 m. The floor of the channel and the walls are built out of granite blocks and the channel is lime-plastered. This channel running in east-west orientation divides the flower beds into two units, northern and southern with twelve and nineteen beds respectively. These flower beds worked out at an average distance of 2 m from each have capillary feeders between them with an average depth of 10 cm and a width of 013 m. On an average each flower bed has a diameter of 0-80 m, the largest having a diameter of more than 1-20 m and the smallest with a diameter of 0-60 m. One flower bed close to the Royal Residence is 3-90 m and one bunch of beds (8) is running parallel to the north-south running eastern screen-wall. The main channel passes 580 m away from the Royal Residence.

The excavation has laid bare an elaborate water system and other accessory structures having a length of more than 125 m that passes through the outermost fortification wall at east, through the main cyclopean abutting the northern wing of eastern *mahadvara* to the entire complex. The main channel running in east-west orientation is constructed out of dressed stone blocks of granite and has a height of 30-35 cm. The floor of the channel is also laid in stone with traces of 3 to 5 mm thick lime-plaster at places. The undisturbed channel found close to the north of the outer *mahadvara* has dressed stone slabs for covering. This channel contains a regulator below the north-south running eastern screen-wall of Royal Residence to monitor the flow of water into the tanks located to the nc-th and west of Royal Residence. The channel has a width of 22 cm and a depth of 0-17 to 0-35 m.

The excavation has also brought to light the northern screen-wall of over 15-15 m to the north of the Royal Residence and also highly disturbed shallow plastered trough and a sub-terranean water storage masonry-cum-rock-cut tank to the north of Royal Residence.

The ceramic assemblage comprised the Chinese porcelain, glazed ware and earthen ware of red and grey variety of utilitarian typology. The antiquities are in the form of mutilated worn-out stucco figures of floral and animal motifs. Usual metal antiquities like iron nails, clamps, fasteners and hooks have been found. However, the most outstanding find comprised an ovalish pawn *supari*-box in silver with hinges. Both the broader sides of the *supari-box* bear sun motif.

The terraced Royal Court and the northeastern *mahadvara* to the Royal Court exposed during the year 1993-94 and 1994-95 have been duly conserved. The northern, southern and western walls of the royal court built in uncoursed rubble masonry has been raised to the required height in the same constructional pattern and made water-proof by recessed lime-plastering as per the original. The central offset veneered architectural mouldings of the second tier which had been greatly disturbed, due to wanton destruction, exfoliation caused by fire activity and subsidence have been restored to original plan and elevation by suitably mending the highly fragmented architectural mouldings with suitable adhesives. During the course of restoration, highly mutilated elephant

balustrade of the second tire at south has also been suitably mended and remodelled as per the original with the fragments available. In addition, the three tiers have been suitably mended and reset as per the original. The different layers of plastered floor and walls have been suitably filleted and edged. The highly depressed and undulated wall of the Royal Court has been levelled and the extant plaster has been suitably edged and strengthened (pl.IX).

The northeastern main entrance of Royal Court had also been greatly disturbed and the entrance passage choked with debris. Many architectural units were found dislodged from their original position while some were missing. The veneering *adhishthana* members of the *mahadvara* both in its northern and southern wings had suffered extensive damage due to exfoliation and wanton destruction. As a means of prevention, the *mahadvara* has been cleared, the uncoarsed rubble walls provided wherever missing and raised to the required height and the damaged architectural members mended with suitable adhesives and the entire *mahadvara* has been restrored as per the original in its plan and elevation.

20. EXPLORATION IN HOSPET AND KUDLIGI TALUKS, DISTRICT BELLARY.— W. V. S. Narasimham of the Bangalore Circle of the Survey, during the course of his village-to-village survey, discovered the following archaeological remains.

Village	*Nature of remains*
Hospet Taluk	
Vyasanakere (15° 11' 36" N;76°20' 30" E)	A hero-stone of Vijayanagara period
Kudligi Taluk	
Aluru (14° 35' 30" N; 76° 27' 00" E)	A hero-stone and *sati-stone* of Vijayanagara period
Banivikallu (14° 46' 00" N; 76° 26' 30" E)	A copper-plate record dated AD 883; a Kannada palm-leaf manuscript and hero-stones of sixteenth century
Bevoru (14° 52' 00" N; 76° 12'00" E)	Three hero-stones of pre-Vij ayanagara period and a few loose sculptures of Vijayanagara period
Chirisi (14° 47' 00" N; 76° 23' 00" E)	Inscribed hero-stones of Vijayanagara period
Choudapura (14° 47' 00" N; 76° 19' 00" E)	Two ancient irrigation tanks of *circa* sixteenth century; a Kannada inscription of seventeenth century; a Balasugriva Temple of eighteenth century

Village	*Nature of remains*
Gaj apura (14° 52' 30" N; 76° 19' 00" E)	A hero-stone of *circa* fifteenth century
Gopalapura 04⁰ 56' 00" N;76° 18' 30" E)	Bristappayya Temple and a small shrine of post-Vijayanagara period and irrigation tank of *circa* sixteenth century
Harakapavi (14° 43' 00" N;76°25' 00" E)	A Kannada inscription of Vij ayanagara period
Hireheggadahallu (14° 56' 00" N;76°20' 00" E)	Irrigation tanks, Isvara and Ramesvara Temples, a four *pillared-mandapa* and a small platform of post-Vijayanagara period
Hire Kumbalakunta (14° 38' 00" N; 76° 24' 00" E)	Two fragmentary hero-stones of pre-Vij ayanagara period and an inscribed slab of Vijayanagara period
Hire Vaderahalli (14° 47' 00" N;76° 16' 00" E)	A sari-stone of post-Vijayanagara period
Hosa Halli (14° 38' 30" N; 76° 28' 00" E)	Inscribed slab of Vij ayanagara period
Hudem (14° 37' 30" N;76°35' 00" E)	Five loose sculptures and hero-stones of pre-Vij ayanagara period
Hulikeri (14° 37' 30" N;76°27' 00" E)	Kallesvara Temple, two hero-stones and a loose sculpture of pre-Vij ayanagara period
Hyalam (14° 51' 00" N;76° 13' 20" E)	Kallesvara Temple and a Kannada inscription
Jammobanahalli (14° 36' 30" N; 76° 34' 50" E)	A slab with a label inscription in Kannada and a hero-stone of post-Vijayanagara period
Jolada Kudligi (14° 45' 30" N;76° 12' 30" E)	Hero-stones and loose sculptures of Vijaya-nagara period
Kalapur (14° 44' 30" N;76° 16' 00" E)	Two inscriptions of eighteenth century
Kallahalli (14° 33' 00" N; 76° 32' 00" E)	Ash mounds and early historic site and Kallesvara Temple of Vijayanagara period

Village	*Nature of remains*
Kandagallu (14° 52' 30" N; 76° 17' 30" E)	Fortress of post-Vijayanagara period
Kanninayakana Katte (14° 47' 30" N;76° 10' 30" E)	Hero-stone of Hoysala period and Kannada inscription of AD 1766
Kenchamallenahalli (14° 34' 30" N;76°29' 00" E)	Hero-stones of post-Vijayanagara period and two Kannada inscriptions of Vijaynagara period
Kotturu (14° 49' 30" N; 76° 13' 30" E)	Murukallumatha, Gaddikallesvara, Sirimath and Renuka Temple of later Chalukyan period; inscriptions and inscribed hero-stones of Vijayanagara period
Kottur Ayinahalli (14° 48' 30" N;76° 11' 00" E)	Kallesvara Temple; inscriptions of the later Chalukyan period; hero-stones and loose sculptures of Jaina Tirthankara and Karttikeya of pre-Vijayanagara period
Kudligi (14° 54' 00" N;76°23' 00" E)	Hero-stone; temple of pre-Vijayanagara period and irrigation tanks of sixteenth century
Kyasanakere (14° 49' 30" N;76°26' 00" E)	Disturbed mound with remains of iron slag and terracotta pipes of medieval period
Lokikeri (14° 37' 30" N;76°30' 00" E)	Memorial and hero-stones with Kannada inscripion of post Vijayanagara period
Moraba (14° 51' 30" N;76° 12' 30" E)	Hero-stones and Kannada inscription of AD 1528
Nagarakatte (14° 43' 30" N; 76° 12' 30" E)	Inscriptions, hero-stones and loose sculptures of Vijayanagara and post-Vijayanagara periods
Nagenahalli (14° 42' 30" N;76° 18' 30" E)	Stone *mandapa* and a label inscription in Kannada of eighteenth century
Nimbalagin (14° 42' 00" N;76°21' 30" E)	Loose sculptures, hero-stones and inscription of pre-and post-Vijayanagara period
Palayanakote (14° 46' 00" N;76°21' 00" E)	Ruined-fort of post-Viiayanagara period

Village	*Nature of remains*
Pujarihalli (14° 36' 00" N; 76° 32' 00" E)	Hero-stone of Vijayanagara period
Rampura (14° 48' 00" N; 76° 16' 30" E)	Kannada inscription of *circa* eighteenth century
Sivapura (14° 57' 30" N;76°22' 00" E)	Stone inscription in Kannada; three hero-stones and irrigational tanks of Vijayanagara and post-Vijayanagara periods
Suladahalli (14° 45' 12" N;76°24' 00" E)	Isvara and Venugopala Temples and loose sculptures of Vijayanagara period
Sunkadakallu (14° 46' 12" N; 76° 19' 30" E)	*Sati-stone* of post- Vij ayanagara period
Tippehalli (14° 35' 00" N;76°33' 00" E)	Hero-stone of post-Vij ayanagara period
Tulahalli (14° 41' 30" N;76°14' 00" E)	Stray neolithic celt and a few muller stones; inscriptions and *naga* stones of late Chalukyan period; inscriptions and loose sculpture of Vijayanagara period
Ujjini (14° 43' 00" N; 76° 17' 30" E)	Siddesvara and Ramalinga Temples of pre-Vijayanagara period; Siddesvara and Jittigappa Temples of Vijayanagara period; *mandapas,* hero-stones and inscription of Vijayanagara and post-Vij ayanagara periods

21. EXPLORATION IN DISTRICT BIJAPUR.— The Post-graduate Centre of the Karnataka University, during the course of village-to-village survey, under the guidance of A. Sundara, assisted by S. B. Chavan, R.S. Birada, C. R. Patil, R. G. Biradar, K. S. Bagewadi along with the M. Phil, students, noticed the following archaeological and historical remains in Bijapur, Jamkhandi and Mudhol taluks.

Taluk	*Site*	*Nature of remains*
Bijapur	Afzalpur	Chinagi Basha Dargah; Sathkabar (tomb of sixty queens of Afzal Khan); tomb of Afzal Khan; remains of Adil Shahi period; sculpture of Hanuman (seventeenth century)

Taluk	*Site*	*Nature of remains*
Bijapur	Ainapur	Monuments of Adil Shahi period
-do-	Arkeri	Amogh Siddha and Hanuman Temples, hero-stones (late medieval period) and monuments of Adil Shahi period
-do-	Bijjaragi	Hanuman and Mahadeva Temples (twelfth century); Manikesvari Temple (sixteenth century); hero-stones; sculptures of Ganesa, *naga,* etc., and inscription of seventeenth century
-do-	Bommanhalli	Temples of Jadeya Shantalinga (eleventh-twelfth century); *Gsv'x-matha; Siva-linga* (eleventh-twelfth century); sculptures of Siva-Parvati, *nandi* and *naga* (eleventh-twelfth century)
-do-	Darga	Sculptures of Mahavira, Parsvanatha, Ganesa, Hanuman, *nandi, naga* and human-faced *Siva-linga* (eleventh-twelfth century)
-do-	Dhanyal	Chalcolithic black-on-red pottery of Brahmagiri (IA) type, fluted core and parallel-sided blades
-do-	Domnal	Sculptures of *naga, dvarapala,* and Siva-*linga* (eleventh-twelfth century)
-do-	Doodihal	Mesolithic chert implements near a stream
-do-	Hittinhalli	Temples of Hanuman, Lakshmi and *panchaloha* image of Hanuman
-do-	Honaganahalli	Mesolithic tools; Sangamesvara Temple (eleventh-twelfth century) and remains of Isvara Temple (Adil Shahi period)
-do-	Honnalh	Chalcolithic site

Taluk	*Site*	*Nature of remains*
Bijapur	Honnutagi	Remains of Honnamallesvara Temple (eleventh-twelfth century), Dargah of Husain Alamgia
-do-	Inganal	Sculptures of Hanuman, *nandi* and Siva (eleventh- twelfth century); mosque of Adil Shahi period
-do-	Jumnal	Hero-stone (eleventh-twelfth century); *dvipa-stambha* of blackstone; temple and sculpture of Hanuman (sixteenth-seventeenth century)
-do-	Kaggod	Mesolithic tools; ruined Kalmesvara Temple (eleventh-twelfth century)
-do-	Kakhandaki	Late medieval site scattered with pottery pieces (fifteenth-eighteenth century); Virabhadra Temple; Sivalaya (eleventh century); Maruti Temple (sixteenth-seventeenth century); Adil Shahi style,mosque and Kalyani Chalukya inscription.
-do-	Kanamadi	Hero-stones (eleventh-twelfth century)
-do-	Kannur	Viraktamatha (three inscriptions); temples of Viresvara, Renuka and Siddharamesvara; Sculptures of Lakshmi, Virabhadra, Ganesa, *naga* and Kalyani Chalukya inscription
-do-	Kavalagi	Virabhadra Temple and four *naga* sculptures
-do-	Khateejapur	Dargah and tank of Adil Shahi period; temples of Virabhadresvara and Hanuman; sculpture of Virabhadra
-do-	Nagathan	Temples ofBiradeva, Hanuman (Adil Shahi period); sculpture of Ganesa, *S'wa-linga* and *naga;* hero-stones (eleventh-thirteenth century)

Taluk	*Site*	*Nature of remains*
Bijapur	Segunshi	Sculptures of Vishnu (Madhava) of eleventh-twelfth century; Ganesa and Nagabandha in the Hanuman Temple (fourteenth century); *makara-torana* with *gaja-Lakshmi* in *lalatabimba* (eleventh- twelfth century)
-do-	Shivanagi	Images of *dvarapala* (eleventh-twelfth century)
-do-	Siddapur	Mesolithic tools
-do-	Sirnal	Temples of Hanuman, Lakshmi and hero-stones
-do-	Tidagundi	Bibi Phatima Tomb of Adil Shahi period
-do-	Tikota	Chalcolithic; temples of Kalmesvara (eleventh-twelfth century); Vijayarama Temple (twelfth-thirteenth century); Dargah of Hazi Mastan (seventeenth-eighteenth century); fort and palace of Kurundabad (Adil Shahi period)
-do-	Torvi	Hero-stones, sculptures of *nandi* and *naga* (eleventh-twelfth century); Temple of Hanuman (seventeenth-eighteenth century); and monuments of Adil Shahi period
Jamkhandi	Kumbara	Chalcolithic
-do- hero-stone		Ramapur ' Middle Palaeolithic tools; (eleventh-twelfth century)
-do-	Siddapur	Chalcolithic
Mudhol	Algundi (Chik and Hire)	Surya image of early Chalukyan period

Taluk	*Site*	*Nature of remains*
Mudhol	Chitrabhanukote	Middle Palaeolithic tools near a cave
-do-	Ingalgi	Middle Palaeolithic; early historical with painted sherds; sculptures of *Si\a-linga,* Mahishasuramardini, Kalabhairava and Ganesa (eleventh-twelfth century)
-do-	Jaliber	Middle Palaeolithic
-do-	K. D. Budini	Early and Middle Palaeolithic
-do-	Mudhol	Middle Palaeolithic; temples of Kalmesvara, Siva, Siddesvara (eleventh-twelfth century) and mosque of Adil Shahi period
-do-	Uttur	Middle Palaeolithic, Kalmesvara Temple (eleventh-twelfth century)

22. EXPLORATION IN HANGAL TALUK , DISTRICT DHARWAD.— Under the village-to-village survey, C. S. Seshadri of the Bangalore Circle of the Survey, explored sixty-six villages, out of which antiquarian remains are reported only from the following villages.

Village	*Nature of remains*
Adur (14° 46' 45" N;75° 15' 00" E)	Kallesvara Temple of *circa* twelfth century, loose sculptures of *Sapta-matrika,* Ganesa and Virabhadra
Alagodukoppa (14° 40' 15" N;75° 12' 30" E)	Sculpture of Nandi, tenth century
Badamgatti (14° 45' 15" N;75° 14' 35" E)	Ruined *Saiva* temple of *circa* eleventh-twelfth century; inscribed hero-stones, architectural members of a ruined temple assignable to *circa* thirteenth century
Bairapura (14° 45' 15" N; 75° 08' 30" E)	Inscribed hero-stones of twelfth century

Village	*Nature of remains*
Balur (14° 43' 30" N; 75° 09' 25" E)	Ruined *Saiva* and Jaina temples *of circa* eleventh-twelfth century; inscriptions from eleventh century to fourteenth century
Bamanhalli (14° 57' 30" N;75°07' 45" E)	Loose sculpture of Ganesa of eleventh century and inscriptions of twelfth century
Basapur (14° 44' 10" N;75°13' 40" E)	Ruined Siva temple *of circa* thirteenth century and an inscription of ninth-tenth century
Belvatti (14° 50' 10" N; 75° 10' 55" E)	Ruined *trikutachala* temple, Jaina *basadi,* inscriptions, loose sculptures and architectural members of eleventh-twelfth century
Bival (14° 45' 30" N;75° 11' 30" E)	Inscription of *circa* ninth-tenth century, hero stones and ^/-stones of eleventh-twelfth century
Buchavalli (14° 48' 50" N; 75° 06' 10" E)	Ruined *Saiva* temple of eleventh century, loose sculptures of *nandi,* gaja-Lakshmi panel, inscriptions and hero-stones of *circa* tenth-eleventh century
Byagavadi (14° 42' 40" N;75° 16' 30" E)	Damaged inscription of twelfth century
Dasaorathkoppa (14° 50' 25" N;75°05' 15" E)	Inscription of *circa* tenth century
Didgur (14° 44' 45" N;75°17' 05" E)	Brick structures of fifth-sixth century, loose sculptures *of Sapta-matrika* and Ganesa of *circa* twelfth-thirteenth century
Gopapur (14° 49' 10' N;75° 17' 45" E)	Inscription of twelfth century and loose sculpture of Ganesa
Guddadmattihalli (14° 45' 30" N; 75° 18' 50" E)	Sari-stone
Hadargeri (14° 51' 10" N;75° 17' 40" E)	Inscribed hero-stone of thirteenth century
Harlapur (14° 51' 35" N; 75° 15' 10" E)	Loose sculptures *of nandi,* Vishnu, Ganesa, *Sapta-matrika* and a ga/a-Lakshmi panel, all assignable to *circa* twelfth-thirteenth century

Village	*Nature of remains*
Herur (14° 43' 50" N;75°16' 05" E)	Inscribed hero and sart-stones *of circa* twelfth century
Hire Basur (14° 40' 25" N; 75° 17' 40" E)	Ruined *Saiva* temple, inscriptions and hero stones of *circa* twelfth-thirteenth century
Hire Hullal (14° 44' 50" N;75° 14' 40" E)	Inscription of twelfth century
Hulikatti (14° 54' 20" N;75°ll' 30" E)	Ga/a-Lakshmi of tenth-eleventh century
Kalkeri (14° 43' 30" N;75°15' 43" E)	Somesvara and other ruined *Saiva* temples of *circa* eleventh-twelfth century; inscriptions from eleventh to eighteenth century, hero-stones, *sati*-stones, loose sculptures of *nandi,* Surya, Ganesa, Mahishamardini and Virabhadra of late Chalukyan period
Kanneshwar (14° 41' 45" N;75° 14' 50" E)	Inscriptions and inscribed hero-stones *of circa* eleventh-twelfth century
Karekyatanhalli (14° 39' 50" N;75°14' 50" E)	Gq/a-Lakshmi panel and loose sculpture of Mahishamardini of twelfth century
Kodiyallapur (14° 46' 55" N;75°15' 00" E)	Inscribed hero-stone and remnants of a temple *of circa* twelfth century
Kondoji (14° 41' 00" N;75°10' 05" E)	Ruined *Saiva* temple, inscriptions and inscribed hero-stones, from eleventh to thirteenth century
Kuntnahosahalli (14° 46' 05" N; 75° 08' 45" E)	Inscribed hero-stone of tenth century
Kusanur (14° 41' 15" N;75°14' 05" E)	Inscription from tenth century to thirteenth century and hero-stones
Naregal (14° 49' 05" N;75°16' 25" E)	*Saiva* temple and another dilapidated temple oftwelfthcentury; inscription and loose sculptures of Sarasvati, Ganesa and *Sapta-matrika*
Nidsingi (14° 50' 45" N; 75° 07' 10" E)	Ornate temple of Siva, tenth-eleventh century; large size sculpture of *Saiva dvarapalas, nandi,* Vishnu, inscriptions and inscribed hero-stone of eleventh-twelfth century

Village	*Nature of remains*
Shingihalli (14° 45' 50" N; 75° 16' 05" E)	Inscription of eleventh century
Somapur (14° 43'05" N;75°14' 10" E)	Hero-stones, *sati-stonc* and loose sculpture of Ganesa of twelfth century
Suraleshvara (14° 45'05" N;75°09' 50" E)	Inscription of thirteenth century in Kannadacharacters
Suralihalli (14° 44' 15" N;75° 12' 40" E)	Inscription of fourteenth-fifteenth century
Tumrikop (14° 45' 00" N;75° 15' 60" E)	Loose sculptures of Ganesa and inscribed hero stone of *circa* thirteenth century
Tuvargop (14° 43' 30" N;75° 15' 05" E)	Inscribed hero-stones of twelfth century
Upanashi (14° 43' 00" N;75° 17' 50" E)	Ruined *Saiva* temple, inscriptions and hero stone of *circa* twelfth century
Vardi (14° 47' 30" N; 75° 17' 30" E)	Inscription of *circa* twelfth century
Yelival (14° 53' 30" N;75°06' 30" E)	Hero-stone of twelfth century
Yellapur (14° 41' 20" N;75° 10' 15" E)	Ruined Siva temple, inscriptions, inscribed hero-stones and loose sculptures of *Sapta-matrika,* ornate *nandi* and Mahishamardini of tenth-eleventh century

23. EXPLORATION IN DISTRICT DHARWAD.— S. K. Potnis of the Directorate of Archaeology and Museums, Government of Karnataka, in the course of village-to-village survey, discovered the following archaeological sites in Shiggon taluk.

Village/Sites	*Nature of remains*
Adavisamapur	Inscribed slab {*circa* twelfth century)
Aratala	Late Chalukyan temple; Parsvanatha, Jaina *bastifcirca* twelfth century); Kannada inscriptions {*circa* twelfth century); sculptures, *masti* and hero-stones

Village/Sites	Nature of remains
Bannikoppa	Kannada inscription on slab; late Chalukyan temples and sculptures
Dhundari	Panel showing gaja-Lakshmi {*circa* twelfth century)
Gotagodi	Late Chalukyan temple; inscribed slab (seventeenth-eighteenth century); *Sapta-matrika* panel
Jandalagatti	Late Chalukyan temple and Kannada inscription on slab
Kunnuru	Inscribed slab (*circa* twelfth century)
Madl	Temple {*circa* thirteenth-fourteenth century) and sculptures (twelfth to sixteenth century)
Mugali	Late Chalukyan temple; Kannada inscription on slab; hero-stones; *Sapta-matrika* panel
Niralagi	Rashtrakuta temple; three Kannada inscriptions; hero-stones; masti-stone and temple (seventeenth-eighteenth century)
Shilavanta Somapur	Inscribed slab (*circa* twelfth century)
Shyabala	Kannada inscriptions; late Chalukyan temple; hero and masti-stones
Shyadambi	Late Chalukyan temple (*circa* twelfth century); inscribed slab and sculptures (twelfth century)
Sisuvinahala	*Kalyana-mantapa* and *samadhi* of Saint Sharief (1819-89)
Tadas	Late Chalukyan temple (*circa* twelfth-thirteenth century); Kannada inscription (fourteenth century); inscribed slab in Kannada (seventeenth-eighteenth century); hero-stones (twelfth to seventeenth century)

Village/Sites	*Nature of remains*
Taralagatta	Late Chalukyan temple (twelfth-thirteenth century); sculptures of *Sapta-matrika,* Shanmukha, Sarasvati, Kalabhavana, *Daksha*-brahma, Ganapati {*circa* twelfth century)
Vanahalli	Late Chalukyan temple; Kannada inscriptions; hero-stones and sculptures

24. EXCAVATION AT SANNATI, DISTRICT GULBARGA.— Excavation at Sannati was conducted under the guidance of D. V. Devaraj, assisted by H. T. Talwar of the Directorate of Archaeology and Museums, in the Ranamandala area (war field). Although there appeared to be an early phase of occupation datable to *circa* third-second century BC, which was confirmed by the occurrence of NBP and Rouletted Wares. Further round and square granaries also point to the engineering skill and the system of storage during the Satavahana period.

A good number of antiquities such as beads of various types, lapis lazuli, green and red jasper, carnelian and shell bangles, terracotta beads, punch-marked and lead coins have been collected.

25. EXCAVATION AT BUDIHAL, DISTRICT GULBARGA.— K. Paddayya, assisted by the staff and students of the Deccan College Post-graduate and Research Institute, Pune, resumed excavation at the Neolithic ashmound site of Budihal in Shorapur taluk. This year's excavation consisted of extension to Trench 8 dug previously in the lower portion of ashmound at locality I. This trench, excavated in the last season, which measured 66 sq m in extent was dug upto a depth of 3 5 cm below surface. It exposed a 2 m wide embankment-like structure of sandstone rubble, which extended beyond the trench on both the southern and northern sides, however, its purpose was not clear.

This season's excavation was aimed to identify the shape and extent of the rubble embankment as also to ascertain its mode of construction and possible use. For this purpose the trench was extended in seven stages and in all directions, finally to cover a total area of 873 sq m. It was dug upto a varying depth of 15 to 35 cm below surface, but control pits exposed natural soil at a depth of 50 to 70 cm below surface. The excavation revealed the following stratigraphy.

10 to 5 cm below surface, soft, light grey soil, derived from ploughing up of decomposed cow-dung or fine ash lenses resulting from the burning of cow-dung; 15 to 25 cm below surface, brownish decomposed cow-dung marked by a series of burnt patches, each 3 to 5 cm thick; 25 to 35 cm below surface, soft, ashy or light grey soil with several thin lenses of burnt soil and charcoal, resulting from the multiple use of the surface for penning, cow-dung accumulation and burning; 35 to 60 cm below surface, continuation of level (3) above; 60 to 65 cm below surface, decomposed cow-dung; and natural soil, as represented by brownish soil covering sandstone surface.

The principal finding of this season was that of the rubble embankment encountered in the trench last year, proved to be part of a large oval-shaped enclosure, in all probability meant for cattle penning. The western and southern limits of the enclosure were not clear, and probably lie concealed under or have been disturbed by the modern bunds serving as field boundaries. The major features of the rubble enclosure were long and oval on plan, measuring 35 cm (east-west) by 27 m (north-south); the embankment itself was 2 to 2-5 m broad with a compact feature. It consisted mostly of pieces (upto 8 to 10 cm across) of sandstone and, to some extent, of limestone and vitrified ash. There were indications that both the outer and inner margins of the embankment were lined with larger sandstone blocks so as to prevent spreading out of the rubble pieces. From the stratigraphy exposed in the trench, it was clear that this feature with rubbles started from the level of natural soil, comprising a height of 50 to 65 cm. On the eastern side there was a crescentic extension to the rubble and this probably served as entrance to the enclosure. Thick thorny matter was kept over the rubble base for strengthening the enclosure. Such stone rubble-cum-thorn enclosures are still in use in the area for penning cattle as well as sheep/goats.

The area within the rubble enclosure exposed several levels of decomposed cow-dung or light brown soil derived from it or soft ash derived from burning of cow-dung. All these levels show extensive traces of burning, leaving behind carbonaceous lenses and charcoal pieces. The nature of sediments exposed within the enclosure indicated that the area witnessed many episodes of cattle occupation. Much of the cow-dung resulting from cattle penning was being cleared from the spot and dumped in the area to the west of trench, thereby leading to the formation of a mound-like feature. The cow-dung left over on the penning surface as well as the decayed thorny matter covering the rubble enclosure were being burnt and the surface thus rendered hygienic for another episode of cattle penning. Cultural material found comprised Neolithic pottery, stone tools and faunal remains in small quantities in the various deposits.

In addition to cattle penning, the area enclosed by the rubble embankment was sometimes being used for various human activities.

In the western part of the trench, at a depth of 25 cm, a circular platform (about 9 sq m in size) of sandstone blocks was found. The area around showed extensive traces of burning and also yielded considerable cultural material comprising pottery, chert blades, knives, cattle and sheep/goat bones ingesting thereby some community cooking and feasting. There were three instances of human child burial (Nos. 11 to 13) and another three of animal bones noticed in cow-dung deposits. Besides, three clusters of chert blades and debitage (a few hundred pieces in each case) were also noticed; these were probably deposited as a part of fertility rites.

26. EXCAVATION AT TALKAD, DISTRICT MYSORE.— In continuation of the previous year's work *(1993-94,* pp. 66-67), the Directorate of Archaeology and Museums, Government of Karnataka, resumed excavation at Talkad, in collaboration with the University of Mysore, under the direction of D. V. Devaraj and A. V. Narasimha Murthy, assisted by M. S. Krishna Murthy, N. S. Rangaraju and Swamy.

Excavation was carried out horizontally to know the complete nature of long wall exposed earlier. Almost 50 meters of wall was uncovered which continued further down. Attached to this wall was found a brick-lined well. The well with its own water inlet, contained a fine mud-plastered square chamber.

Another wall of burnt-bricks running north-south was exposed to a depth of 20 meters. The thickness of the wall was 10 feet which was almost uniform throughout. Another interesting point in this brick-built wall was the parallel brick placement at regular intervals. In one trench twenty-four courses of bricks were encountered while another contained thirty courses of bricks. The mortar used was fine mud. The thickness of the walls varies between 1 m and 2-70 m. At the bottom of the wall were noticed brickbats. The walls probably served as defence against floods from River Kaveri.

During the course of excavation many important antiquities were collected. These comprised a few microlithic blades, points and cores, semi-precious stone beads, kaolin, Russet-coated painted pottery, ivory and shell bangle pieces, pieces of terracotta seal, intact pots, and a few broken stucco figures, were among the other important antiquities, besides an inscribed red ware, containing an inscription which reads *ishivan*\ On the basis of its palaeography it could be assignable to the seventh century AD.

Another interesting discovery of this excavation was the collection of a few microlithic blades, points and cores.

27. Excavation at Banavasi, District Uttara Kannada.— K. P. Poonacha, assisted by T.M. Keshava, M.V.Visweswara, T.P. Balakrishna Unnithan, Somla Naik and M.V. Mallikarjuna, of the Bangalore Circle of the Survey, continued the trial-excavation in two sectors inside the fortified township of Banavasi, taken as a sequel to the result of four period chronology from the previous excavation Chutus, Satavahanas, Kadambas and post-Kadambas in the ascending order. This excavation aimed at ascertaining pre-Chutu levels inside the fortification.

In Sector-I, three trenches of 5 m sq were laid in the backyard of M. C. Wodeyar, in close proximity to the famed Madhukesvara Temple and were excavated upto a depth of 3-50,2-55 and 1 -80 metres respectively marked as B, C and D. Trench B immediately to the east of Trench A of the previous season has turned out to be more potential and the four period chronology is reaffirmed once again. The Trench C immediately to the south of Trench A is greatly disturbed due to heavy pit activity and in Trench D the structural activity of Period-Ill, i.e., Kadamba was noticed and the work had to be abandoned due to unseasonal rains.

In Trench B, a sufficiently high brick wall of reused bricks of the size of 0-36x0-19x008 and 0-20x0-40x0-07 metres in twenty-seven courses of Kadamba, post-Kadamba phase was found as a structural activity of Period-III and IV (pl.X). This wall runs to a length of nearly 3 metres and has a wall width of 30 cm. At the working level of the structure, an offset is noticed at a height of 1 -57 m wherein disturbed floor activity is also noticed. The foundation of this structure goes through the levels of Period-II (Chutu) as well. Above the disturbed floor a fragment of Kadamba inscription in beautiful box-headed characters is found. The trench reveals the following ceramic pattern period-wise as detailed below.

Period	*Strata*	*Pottery*	*Typology*
I (Chutu)	8 and 9	Chocolate brown ware, red-slipped ware, Red Polished Ware and black-and red ware	Utilitarian types of lids, bowls, etc
II (Satavahana)	5,6 and 7	In addition to the above, Red Polished Ware, chocolate brown ware, the percentage of grey ware diminishes. Micaceous red ware, dull red ware, Russet-coated pottery, black-and-red ware, Rouletted Ware are the most significant ceramics	An interesting type is flask-shaped imitated Roman amphorae in Red Polished Ware, small globular flask in red ware with a short neck and a flat base, in addition to usual utilitarian types. Interestingly, the exterior body of some of these spheroid vessels have decoration like *svastika,* etc
III (Kadamba)	3,4 and 5	In addition to the above, Red Polished Ware, chocolate brown ware	Interesting types are conical ring-based wide bowls, carinated vessels with decorated shoulder and large quantity of spouted vessels
IV (post-Kadamba)	1 and 2	Red-slipped ware, grey ware, dull red ware and micaceous red ware	Lids, wide-and small-mouthed carinated vessels, spheroidal pots, conical bowls, lamps, incense burner, etc

Inspite of limited area of excavation, the trench yielded very good number of antiquities from the first two periods. From the level of Period I (Chutu phase) represented by strata 9 and 8, lead coins of Sivalananda and Sadakana have been retrieved. The strata 8 and 9 of this period have also yielded paper thin glass pieces, a large quantity of nodules and waste flakes of amethyst, carnelian, quartz, agate — indicating a very good lapidary industry wherein beads of the above semi-precious stones in various stages of manufacturing have been found. The antiquities from layers 6, 7 and 8 (8 overlapping with Period I) have attested to the occupation of the Satavahanas

as evident by the numismatic and ceramic assemblage. The intense structural activity of the period is reported earlier. These layers are rich in terracotta sculptures heavily encrusted. Of the terracottas mention may be made of the finding of Hariti Yakshi (mutilated), face of Buddha and a Bodhisattva with a *chaitya* in the crown (pl.XIA), establishing for the first time the Buddhist antiquity of Banavasi in a stratigraphic context. It is to be noted that Hiuen Tsang had visited Banavasi (ancient Vaijayanti) and had noticed many stupas towards the north of the township. It is also to be noted that the excavations conducted by the Department of Archaeology, Government of Karnataka, in collaboration with the University of Mysore, earlier (laid bare a *chaitya)* which had also been doubtfully identified as Buddhist *chaitya.* In addition to the above, two seals with fish design and ram-head (pl.XIB), retrieved from this period, point to the trade and commerce activity of the people during the period. The oval seal with fish design has on its obverse a lotus in bloom with long stalk and two fishes on either side, within a cerrated margin. On the reverse highly stylized geometric decoration in the form of a leaf is set in a border. This (606 cm) seal, is grooved laterally to serve as a grip for holding. The scale designs on the body of the fish are sufficiently worn-out to indicate its use (pl.XIC). This seal might have been issued perhaps by merchants for trade through river and sea. The ram-headed seal is fashioned out in the form of a dabber with a handle. The free end, roughly circular, has a prominent face of a ram with downward curved horns forming the border as well. The eyes, ears and forehead marks are produced by applique design. The mouth is slightly open with pierced nostrils. Undoubtedly, this was also a trader's seal. The strata of this period is also marked by floor activity and thin layers of ash and charcoal streaks are also found. Many crucibles have been found from the strata attesting to the metal smelting for coins since many heavily encrusted lead and copper coins have been retrieved.

However, the most important discovery is that of a sherd of soapstone casket or container with inscriptions in pre-Christian Brahmi characters, perhaps referring to Magadha (Migdha). On palaeographic grounds this may be dated to *circa* second century BC or even to an earlier date. Even though found in the levels of Period II, it is the earliest record of Brahmi writing found at Banavasi for the first time which indicates the presence of a pre-Christian level at Banavasi, contemporary to the Mauryas. Lead and copper coins, beads of semi-precious stones, gold plated lac beads, beads of terracotta, glass bangles, copper objects, stone objects like testing stone, goldsmith's pounders, grinders, form the other antiquities of interest. The Period III of Kadamba phase is marked by the structural activity, ceramics as well as a few iron objects, beads of lac, coral, glass and semi-precious stones, a few mutilated terracottas, prominent grey ware, red ware, besides a small percentage of micaceous red ware.

Period IV (post-Kadamba phase) is represented by bead and bangles on glass, coins of post-Vijayanagara period and pottery of red and grey ware.

Excavation carried out in Qd IV of Trench D laid bare interesting walls of Period II, with an average width of 30-35 cm and a height of 0-60 - 0-80 m. A few beads of terracotta and semi-precious stones were the antiquities retrieved from this period.

With a view to expose and understand the structural activity and to substantiate the chronology obtained in Sector-I, a fairly well-preserved mound Sector-II, about 6000 sq m, located to the

north-east of the Jaina temple, was subjected to a trial-excavation by laying Trench A of 10 sq m and excavated to an average depth of 1-50 to 200 m in Qds 1,2 and 3. Structural activity of post-Kadamba phase of fragmentary brick-built walls and floors were unearthed just below the humus of 10 to 15 cm.

KERALA

28. EXPLORATION IN KOTTURVAYAL, DISTRICT KANNUR.— P. Rajendran of the Department of History, University of Kerala, during the course of exploration in Sreekandapuram in north Kerala discovered three laterite rock-cut caves and an urn-burial at a hill-slope facing east. These caves, separated by two to three metres apart, have separate passages leading to entrances. Behind these, at a higher slope on the ground, there was a crescentic boundary made with laterite slabs to prevent downward flow of rain-water to the caves.

All the three caves have vertically cut rectangular front and the first two of them have small rectangular entrance at the middle near the base while the third one having an arched entrance. The height and width of rectangular front wall of Cave I is 1-15x1-73 m while those of Caves 2 and 3 are 1-35x1-83 m and 117x1-17x1-5 m respectively. Caves have hemispherical roof inside and the first one from right has a square cut pillar of laterite at its centre. The diameter of each cave from the right one to the third is 2-93 m, 2-85 m and 235 m respectively with the respective central height of 105 m, 105 m and 0-95 m.

The front part of the caves have several rectangular inward cuttings leading to the entrance (pl.XIIA). The passages are three metres long with the same width as that of the frontal part of the caves. The Cave 1 has elongated nitches, one each, on both the sides of the entrance. The entrance of Cave 1 has 72-5 cm height and 40 cm width while the other two Caves (2 and 3) 77-5 cm and 43-8 cm and 65-5 cm and 57-5 cm respectively. The frontal part of Cave 3 is slightly smaller than the other two. The laterite slab at the entrance of each cave is slightly larger than the entrance in its height and width and was placed from outside.

Passages to the caves were filled with soil. Apart from wheel-made, well-baked pottery there were a few pieces of human bones and iron implements found on the floor itself. Pottery comprised small pots, bowls, tripods and a wheel in red ware, black-and-red ware, and black polished ware. Human bones included the fragments of skull and limb bones of a child. The presence of a few teeth indicated the age of the child to be around six years. The iron implements comprised only a handle of a shovel.

Single urn-burial has also been located fifty metres away from the cave site at the slope. It revealed a small cup in black polished ware. The big pot has a conical base and thick wall.

29. EXPLORATION IN DISTRICT KOLLAM.— P. Rajendran of the Department of History, University of Kerala, Thiruvananthapuram, during the course of exploration in various parts of Tenmala-Kulathupuzha region in the Western Ghat area, discovered Lower Palaeolithic stone tools comprising handaxes, scrapers, pointed tools, backed implements, etc., made exclusively on quartz. It is for the first time that a genuine handaxe in mint condition has been

reported, indicating the co-existence of both the chopper-chopping and Acheulian technology in this part of the western coast in India (pl.XIIB).

In the course of exploration, a number of urn-burials were noticed which were exposed during a building construction. Large pots were found buried at a depth of 1 -5 m by cutting through hard laterite. Some of the pots have lids also. Pots were filled with fine soil and interestingly a few pots also contained human bones. There were large pots in red ware with their mouth wide open having an average height of 80 cm and the maximum diameter of 65 cm (dia 45 cm). Most of the jars are tapering down at the bottom. A few of them have small flat bottom with one or two perforations at the base. Besides some small pots, no other object could be recovered. These small pots consist of black polished ware.

Another discovery comprises a Menhir site (pl.XIIC) at Abhayagiri with two large elongated rock-slabs (3mx2m), oriented east-west. Besides, late Megalithic iron-ore smelting site was also noticed. Crucibles, iron slag, smelting blocks of iron and charcoal were found in large quantity. According to the metallurgical analysis of the smelted iron blocks and slag, carried out at the Regional Research Laboratory, Thiruvananthapuram, the iron content varies between 35 and less than 0-5 percent respectively.

30. EXPLORATION IN DISTRICT KOZHIKODE.— P. Rajendran of the Department of History, Kerala University, discovered the remains of four hemispherical laterite rock-cut caves of the Megalithic culture at Palangad in Thamarasseri, District Kozhikode in north Kerala. Four of them have been identified which were filled with soil. There were fragments of pottery and iron implements inside.

The pottery comprised both wheel-made, well-baked large and small pots, bowls, lids, wheel etc., in red-ware, black-and-red ware, and black polished ware. Some of the pots bear incised decorations. The iron implements including a highly corroded sword with a hollow handle, rods etc., have been collected.

Further, P. Rajendran of the Department of History, University of Kerala, also discovered two more urn-burial sites at Pullumala in the same district. The finds comprised large jars, small pots and an iron implement. The jars were found four metre apart at a depth of 2 metre and they were closed with prepared rock-slabs (65x50 cm; 42-5x36-25 cm). The big jar with conical bottom has a depth of 90 cm and a maximum bulge of 60 cm at the centre. The pottery indicated the presence of rice husk in the clay. There was however, nothing inside the jar.

31. EXPLORATION IN DISTRICT THIRUVANANTHAPURAM.— P. Rajendran of the Department of History, Kerala University, discovered an ancient iron-ore smelting site, probably of late Megalithic period, at Ezhavannikonam in Bharathannur near Darpavila in the northeastern part of Thiruvananthapuram. Smelted crucibles of iron (about 15 to 20 kg) have been found. Burnt wood, charcoal and iron slags were also found at the site. Laterite gravels, present in the crucibles, indicated that it was the ore used for smelting. The metallurgical analysis of the smelted iron at the Regional Research Laboratory at Pappanamkod in Thiruvananthapuram, revealed the presence of about 35 percent of iron content in them.

MADHYA PRADESH

32. EXCAVATION AT MANDHATA, DISTRICT EAST NIMAR.— R. C. Agrawal and D. Dayalan of the Bhopal Circle of the Survey, under the Narmada Valley Development Authority Project, exposed *khura* and *skandha* mouldings on the east of the Chaubis Avtar Temple. The mouldings were decorated with a series of diamond and swan designs. On the basis of available evidence, it was ascertained that the temple was built on a platform and the surrounding area was paved with stone-slabs. The star-shaped temple bears similarity with the *bhumija* temples of Un. The flag stones provided at the flooring were found originally joined together with iron clamps. Among the sculptures dislodged from their exact position, mention may be made of Siva, *dikpalas* such as Varuna or Indra and various forms of *apsaras.* Mason's marks and names of masons in Nagari characters were also noticed on the temple mouldings. Excavation also revealed copper coins of British period along with the coins of the Scindhias.

33. EXCAVATION AT KOTWAR (KUTWAR), DISTRICT MORENA.— In continuation of the earlier work, the Bhopal Circle of the Survey, under the direction of R. C. Agrawal, assisted by Narayan Vyas, conducted excavation at the Gadhi mound. At a depth of 1 -25 m from the surface, a part of the floor made of stone chips was traced. Towards north at the same level there were patches of mud-floor (lumps of yellow mud). During the work, fragment of a bone pendant, terracotta bull, bangles and beads besides some pottery were recovered.

Excavation on another small mound near Gadhi, yielded a dilapidated stone-wall with lime floor at a depth of 95 cm. In the construction of wall in Pratihara style, decorated architectural fragment was found reused. Pottery with incised design, spouted vessels, storage-jars, terracotta beads and bangles were also found during the work.

34. EXCAVATION AT SANCHI, DISTRICT RAISEN.— In continuation of the previous year's work *{1994-95,* p.71), A. K. Sinha, assisted by D. Dayalan, Narayan Vyas, R. R. Vallabhi, Manuel Joseph, R. K. Shrivastava, O. B. Khobragade, C. K. Bhanarkar, of the Bhopal Circle of the Survey, conducted excavation on the western slope of the hill at Sanchi. The main objective of excavation was to lay bare buried structures towards the western slope and south of the ancient pathway leading to Stupa No. 2.

During the exploration at Sanchi hill, a cluster of stupas and two apsidal temples were located on the western slope, on the south of the ancient pathway, which leads from Tank No. 1 to Stupa No. 2. Besides, a number of other spots were also located as they were found to contain buried structures.

On the basis of exploration, it was decided to excavate the area around the stone bowl located on the rear side of Monastery 51, to ascertain its exact location and also the area outside the monastery to uncover the details of its structural phases and the area where the votive stupas were located on plan.

The excavation conducted around the stone bowl for tracing its actual location did not reveal much except that the bowl was placed on a heap of earth mixed with red *murram.* This heap in the form of a circular mound was provided with boulders, arranged all around and one above the

other most likely with the purpose to hold the loose earth. While excavating at the bottom of the elevated portion on the north of the bowl, lowest course of a wall set in mud-masonry in east-west orientation, measuring about 15 m in length was also traced. Although, traces of a few more walls were also unearthed, no clear picture of the structure to which they originally belonged could emerge. However, it is worthwhile to record that a fairly formidable wall running in north-south direction was traced on plan. On surface, this wall was traced amidst bushes even beyond the pathway, which leads one to Stupa No. 2.

The excavation also exposed a cluster of twenty-four votive stupas (pl.XIII). None of these stupas were found to have more than three basal courses. All these stupas were raised directly over the bed-rock after making the surface plain (pl.XIVA). Interestingly, all the stupas were found enclosed within an enclosure, which is roughly oblong in shape. The enclosure-wall comprised unfinished boulders placed directly over the rock. A part of the enclosure-wall was found buried. These boulders were arranged in an alignment and were placed vertically. Clearance and excavation at four stupas, which were built in north-south alignment, further down the hill on the western slope of the hillock itself were also taken up. All these stupas are bigger in size and were built on square platforms.

Another area, where the excavation was carried out is the site around the Monastery No. 51. During the period under report, the rear side of the monastery was taken up for excavation, which exposed an earlier structure of random rubble-wall set in mud-mortar, comprising in all eleven extant courses, over which the existing monastery exists. There was also found a hiatus between the two structures. Interestingly, the earlier wall exposed during recent excavations had a regular projected platform, exactly in the middle of the north-south wall, which presently accommodates the staircase on the rear side. Trial-pits taken along the east-west and north-south arm of the monastery further confirmed features exposed on the rear side. The excavation at the ground level also revealed that an apron was provided of rammed burnt brick-bats around the monastery at its working level. The debris just above this layer of brick-bats had a sloping tendency and comprised pottery comparable to those found in late-Mauryan, Sunga and Kushan periods. A few pieces of NBPW, sprinklers, inkpot-type lid, fragment of a votive tank, etc., were recovered from the debris. Detailed analysis of pottery recovered during excavation outside the monastery was under progress to trace the working levels, which might have changed at different periods. A trial-trench was also taken up inside one of the cells of the monastery to arrive at more relevant details. It is now almost confirmed that the monastery had atleast three structural phases with the earliest going back to the Mauryan period.

35. EXCAVATION AT SATDHARA, DISTRICT RAISEN.— In continuation of the previous year's work *(1994-95,* pp.71-72), under the UNESCO Project, the Bhopal Circle of the Survey, under the direction of A. K. Sinha, assisted by Manuel Joseph, Nitin Shrivastava, K. K. Rai, C. R. Bhanarkar, took up excavation at Satdhara. Even Cunningham had reported that the main stupa at Satdhara was as big as that of Stupa No. 1 at Sanchi. However, on detailed examination, it was found that the Satdhara example contained no *torana* gate. Other features were found almost the same, both

in dimension as well as in architectural details. It is interesting to note that the work started by the Survey in 1994 resulted in the discovery of many new stupas, thus increasing the total number to as many as forty. Besides, fourteen rectangular structures in stone were also located. The previous excavation had brought to light remains of two apsidal temples, facing each other on the east besides a number of brick structures in a very dilapidated condition on the east of the main stupa. It is pertinent to mention here that all the structures seem to have been built roughly within a span of a century, datable to *circa* second century BC. Out of the forty odd stupas discovered here, the main stupa was built at the highest point. Other stupas of varying dimensions were located at fairly lower levels as per the contour of the hill. The main monasteries, discovered by Cunningham were located on the west and north of Stupa 1.

Stupa 1 or the main stupa was built over a huge platform measuring 91 -90 m north-south and 32 m east-west with maximum and minimum height respectively being 1-05 m and 5-85 m, depending upon the slope of the hill.

It was decided to remove the fallen debris resting against the brick stupa scientifically to know its exact plan and the extent to which the damage has been caused to it. After removing debris, it was found that the main stupa, had concealed an earlier brick stupa, built most plausibly during the Mauryan rule, similar to Stupa 1 at Sanchi. Although, not a single railing pillar was found *in situ,* evidence available at the site indicated that the stupa was not only provided with a balustrade on the ground but also around the *medhi* (drum) and on the top, enclosing *chhatravali.* On the basis of shape, size and decoration of railing pillars, it was found that the ground railing had an arrangement of L-shaped gateways, similar to Stupa 2 at Sanchi, facing the four cardinal directions. Each railing pillar had a medallion in the centre and half medallions at the ends. While the ground railing was fixed right under the floor level after digging a pit, the railing at *medhi* had special arrangement for fixing as indicated by mortises on the slightly curved stone slabs and tenon on the - either side of the railing pillars. While the lower end of the railing pillars with tenon were meant for insertion into the mortises of the curved slabs, the upper tenon used to accommodate the coping stone. The double stair-way to approach the berm of the stupa, i.e., *medhi* on the west was also located. The stupa had three-tired *chhatravali* also enclosed within a *harmika* on the top as was evident from the debris of *chhatravali* of varying dimensions with ribs in the under side.

The main stupa having stone veneering is 33-20 m in diameter and is 13-50 m in height (extant). The diameter of the stupa excluding the *medhi,* which is 1 -20 m in width, is 30-8 m. The height *of medhi* is 3m from the ground. The width of the *medhi* at the top is 1 -60 m, which clearly indicated that the main stupa during the time of construction itself had started taking the shape of hemisphere even from a level below the *pradakshina-patha* or *medhi.* It was revealed that the brick stupa was 26-50m in diameter and its extant height was roughly 12 m. Very interestingly, the stupa was found raised over a 90 cm high plinth with its outer projection measuring 80 cm. Although, it would be still premature to state that the brick stupa had diminishing terraces at intervals as one goes up, traces of the same were visible, when looked at carefully. However, the exact position will be known only after the removal of undisturbed veneering stones and the packing of stone mixed

with mud resting directly against the brick stupa. Another significant evidence which could be traced on plan was the existence of 90 cm wide *pradakshina-patha* all around the brick stupa at ground level. The bricks used in the construction measure 40x40 cm and the courses were found set in mud-mortar. In a large-scale excavation at Monastery 1 (north-west of Stupa No. 1) and Monastery No. 2 (west of Stupa No. 1), these monasteries were in a dilapidated condition and had almost turned into the shape of heaps of stones and mud. The excavation at Monastery 1 revealed that it was a rectangular structure (pl.XIVB) approachable from the south by a flight of steps. On the basis of architecture of monasteries, it was inferred that the cells were raised for living over a high platform, perhaps keeping in view the safety and security of monks from the wild animals. In Monastery 1, a square barn having a depth of 4 m was exposed on its northwestern corner. Another flight of steps on the north-west corner facing south was also found. But interestingly, a wall constructed at a later date had blocked it partially. A few shabby looking stone-walls were also exposed running parallel to each other in north-south orientation on the top of the monastery. Discovery of terracotta tiles, datable to *circa* second-first century BC from the upper levels confirmed the date of its construction assigned from other sources, i.e., contemporaneity to second phase of the main stupa. Architecturally, Monastery 2 was no exception, built roughly in the same fashion.

Among the important antiquities that have come to light during this season mention may be made of iron object, coins, fragmentary inscription bearing Brahmi letter in Sunga character *{circa* second century BC). Apart from these, fragments of two beautiful elephant figures in Chunar red sandstone with brilliant Mauryan polish were found from the packing between the veneering stone and the brick stupa. While the one figure was found from the northern side, the other was recovered from the southern quadrant. It seems, the brick stupa, originally, had some arrangement to accommodate the elephant figures. Perhaps, further excavations around the main stupa might bring to light more evidence to establish this assumption.

36. EXCAVATION AT DHANUHI, DISTRICT REWA.— Dhanuhi rock-shelter (Lat. 24° 37' 10" N; Long. 82° 13' 55" E) is in the Adwa Valley, on the borders of the two Districts *viz.,* Rewa and Sidhi. The topography of the site, its setting in the eco-zone of the region, concentration of the lithic artefacts both inside and outside the shelter and the distribution of similar artefact clusters in the surrounding area of the rock-shelter attracted the attention of the archaeologists of the Department of Ancient History, Culture and Archaeology, University of Allahabad. The site was subjected to excavation by a multi-disciplinary team consisting of Prakash Sinha, U. C. Chattopadhyaya, D. K. Shukla, under the direction of V. D. Mishra.

Dhanuhi rock-shelter (pl.XVA) is situated towards west on the left side of the Adwa Nala at a distance of about 500 m. The opening of the rock-shelter is facing east. It is an isolated structure and located on the foot of the Vindhyan hill. The open area between the rock-shelter and the hill is covered by the forest and the distance between them is approximately 500-600 m.

The archaeological context of the rock-shelter suggests that it is 9 m long in the north-south and 5 m wide in the west-east direction. Hence, 9x5 m area was divided into 45 grids of 1 xl m and were alphabetically labeled from west to east and numerically from south to north, keeping in mind

that the size of the site may extend in the east as well as in the north. Out of these 45 grids, A-6 to A-9, were not available for excavation being under the walls of the rock-shelter while A-2 to A-5, B-5 to B-9 and C-8 to C-9, were partially available. Therefore, five grids namely B-4 and C-4 to C-7, inside the present roof of the shelter and three grids namely D-6 to D-8, just outside the present roof, after removing fallen blocks of the roof, were taken up for digging. A pit of 0-5xO5m had been dug up to the depth of 0-45 m by some person prior to the excavation covering the area of C-2 and C-3. Therefore, to utilize this disturbed limited area for excavation, it was converted into 1 x 1 m trial grid.

The thickness of the deposit varies from grid to grid because of undulating surface of the bed-rock. In C-4 and C-5 further digging had to be abandoned at a depth of 48 cm and 48-5 cm respectively, from surface because of big rocks and inadequate time to excavate D-4 and D-5, as also to ascertain the nature of rocks. In B-4 also, the level of the bed-rock could not be reached and only a deposit of 115-5 cm was exposed. This grid was taken up after discontinuing digging in C-4 and C-5 to get an idea of potentiality of the archaeological material deep inside the rock-shelter. So far exposed deposit of B-4 suggests a very low frequency of the cultural material in relation to C-6, C-7, D-6, D-7, D-8 and even with the trial grid (C-2 and C-3). The depth of the bed-rock varies from grid to grid which is raised a little in grid 7 and dipping towards north-east in D-8 and towards south-west in D-6 and C-6. The maximum thickness of cultural material unearthed in C-6, C-7, D-7 and D-8, is 110 cm, 98 cm, 65-5 cm, 62-4 cm and 68-5 cm respectively, while the bed-rock is present at a depth of 83 cm in the trial grid (C-2 and C-3).

The composition of soil, presence of a number of roots and ant-holes posed serious problem not only from the point of view of stratigraphy but also in keeping the exposed artefact *in situ.* Almost whole of this deposit is made of small nodules *(kankar).* Stratigraphically, the deposit is divisible into two broad strata, the upper is blackish red stratum while the lower shows brownish red stratum. The upper stratum has been divided into two layers. Layer 1 is very loose blackish red loam with low frequency of tiny-sized *kankars* and layer 2 loose is blackish red loam with higher frequency of small-sized *kankars.* The lower stratum is also divisible into two layers *viz.,* layers 3 and 4 after top layer. Layer 3 is brownish red loam in colour, consisting *of kankars* while the colour of layer 4 is a little darker shade of brownish red loam and the dimension of the *kankars* is little more in relation to those of layer 3. Thus, in all there are four layers, the excavation however, was carried out on the basis of spits.

A preliminary analysis of the cultural material suggest that the first two layers are disturbed, consisting of stone artefacts, potsherds, both hand-made and wheel-thrown, fragments of animal bones and teeth, shell fragments, sandstone fragments and burnt-clay lumps. While the cultural material of layers 3 and 4 include stone artefacts, hammers, hammers-cum-anvils, anvils; fragments of animal bones and teeth, shell fragments, sandstone fragments, ochre colour nodules, chunks of white chalk and burnt clay lumps. There is absolutely no recovery of potsherds from the lower stratum except one potsherd in C-6 close to the root hole. Thus, the archaeological deposit could be divisible into two periods, Period-I and Period-II.

The cultural material recovered from Period-I, i.e., layers 3 and 4 showed no marked change. The occupation at the site was not continuous from the bottom of layer 4 to the end of layer 3, rather it was exploited nearly at regular intervals. More than eleven thousand and five hundred lithic artefacts have been unearthed from these two layers. Two main raw materials have been exploited namely chert and chalcedony of various colours and grades. Out of which majority consisted of unmodified waste comprising blades, flakes, cores, core rejuvenating flakes and blades, micro-blades and flakes or tiny chips, nodules, chunks, etc. The frequency of shaped tools was very low, comprising mainly backed-blades, lunates, truncated-blades, percoirs, triangles, drills, borers, scrapers, and retouched blades. A number of fabricators such as hammers, anvils, hammer-cum-anvils and small stone rods or punch were also recovered from the working floors made of sandstones. Typo-technologically they fall in the period belonging to late Upper Palaeolithic.

A number of soil samples and four carbon samples have been collected. The carbon samples are being sent to the laboratories for C-14 dates. However, a tentative date between *circa* 15000 and *circa* 18000 BC could be proposed on the basis of highly fossilized fragmentary long bones of animals.

Considering a very low frequency of shaped tools, a very high frequency of unmodified waste and the presence of tools in the process of making together with hammers, anvils, stone punch and thin deposit of each working floor clearly demonstrated that the shelter was used for some specific purpose. A preliminary analysis suggested that the specific purpose would have been primarily the manufacturing of tools only. It seems in all probability that Dhanuhi rock-shelter was a factory site of late Upper Palaeolithic period.

No precise cultural period could be assigned to Period-II, i.e., layers 1 and 2, because of its highly disturbed nature and recovery of mixed cultural material which ranged from late Upper Palaeolithic to the Mesolithic-Chalcolithic period.

Though a number of clusters of lithic artefacts are present around the rock-shelters, no rock-shelter could be noticed towards the west of the shelter.

37. EXPLORATION IN THE ATJWA VALLEY, DISTRICTS REWA AND MIRZAPUR.— The explorations in the Adwa valley in the Districts of Rewa (Madhya Pradesh) and Mirzapur (Uttar Pradesh) by the Department of Ancient History, Culture and Archaeology, University of Allahabad, resulted in the discovery of several primary context sites ranging from the Lower Palaeolithic to early historic/Megalithic sites through Middle Palaeolithic, Upper Palaeolithic, Mesolithic,Neolithic and Chalcolithic/Megalithic.

Nakwar (NKR) located east to Piprahi on Piprahi-Bagdara Road in District Rewa yielded red ware Kotia pottery from the disturbed Megaliths. Some microliths were also found at the site. One big sized patinated chert flake (seemingly Middle Palaeolithic) was also collected.

From another site Dhengrahi-I (DNH) which is located east to Biradeyee to the left of Adwa near the slope of Kaimur, east of a *nala* were collected sherds of black-slipped ware, red ware,

black-and-red ware generally of thin fabric resembling the Kakoria and Kotia type pottery. Also reported were the Megaliths near Kaimur.

Towards the west of this site is located Dhengrahi-II on the west of the *nala.* From this site were found Kotia pottery, microliths made on chert, chalcedony, agate and carnelian along with a sprinkling of Upper Palaeolithic tools.

From the site Dhengrahi-III were collected mainly the Kotia red ware besides ceramics of later period.

Upper Palaeolithic artefacts made on chert, highly patinated flakes and blades along with a few microlithic blades were found at Mahadeva (MDV) (Bajaha ghat) in District Rewa.

On the right bank of Adwa, District Rewa, is located Amahata (AHT) which yielded highly patinated Upper Palaeolithic artefacts made on chert along with some microlithic artefacts with fluted cores, chalcedony and jasper. A few red ware sherds were also found.

From Pokhari (PKR) to the north-east of Jarkul, were collected sherds of red ware, Kotia ocherous red ware and a few microliths of chert. Some Megaliths were also traced at the site.

Dibhor (DBR) near Kaimur was located in a thick forest area, where Upper Palaeolithic artefacts, fluted cores, blades and flakes were found scattered.

Ghogham (GGM) in Gorma valley near the village of the same name to the north of road running from Hanumana to Amiliya (at the 13th kilometer stone) yielded Upper Palaeolithic artefacts made on patinated chert and a few microliths, marked by raised patches of rocks and bad-land topography.

Masuriha (MSH) located on the Naiya river about 2 km away from Hanumana towards Hanumana-Rewa Road, revealed several painted and plain rock-shelters besides some Upper Palaeolithic and Microlithic artefacts. The Middle Palaeolithic artefacts were also collected from the surrounding areas of some of the rock-shelters.

Bagheli Tola near village Jarkul on the left bank of Adwa, yielded red ware pottery of thin section mostly comprising hand-made and rusticated red ware, with evidence of neolithic traits.

Megha-I, near Adhesar hillock in District Mirzapur (Uttar Pradesh), revealed highly patinated Upper Palaeolithic artefacts and microliths made on chalcedony, chert, jasper and agate, while Adhesar west-I yielded only the Kotia type red ware pottery. From Magarahwa on Pokhara *nala,* north of Manigara were collected red ware and black-slipped ware of Kotia type; microliths including fluted cores, blades and flakes made on chert and chalcedony besides muller and a fragmentary ring-stone.

On the left bank of Adwa on the slope of Kaimur is located Jarkul which revealed ocherous red ware, Kotia pottery, a muller and a core on chert.

Another site Pokhara-I on the right bank of Adwa, just opposite village Karikach, about one km south of village Pokhara, yielded early microlithic industry, mostly made on grey-coloured

chert. A few pieces were found fashioned on crystal, carnelian and agate. The finished tools include lunate, point and truncated blade. The site appears to be an important occupational site. From a nearby sub-locality were collected some Kotia pottery, mostly comprising the sherds of ocherous red ware.

To the south-west of Pokhara-I, towards right bank of Adwa, along the both banks of a *nala,* has been located Pokhara-II, an early mesolithic site. The artefacts include several big-sized fluted cores of chert.

From a site on the right bank of Jhaprahwa *nala,* Manpasar (Baraunha-I), early microliths comprising finished tools like lunate, backed-blade and points were collected. Other significant features noticed here are the cord-impressed and rusticated pottery—a neolithic trait of Belan and Son valleys. Kotia type pottery was also reported from Baraunha-II which is located to the north of Baraunha-I.

Lakshman Bag-Jarkul, on the eastern slope of Kaimur, on the left bank of Adwa, yielded Kotia type pottery and a few microliths.

At a distance of about one km north of Magha on the right bank of Samarmara *nala,* another important primary occupational site Adhesar south-west slope of Upper Palaeolithic culture was noticed. The site yielded finished tools made on greyish chert along with a good example of flakes and core of chert. Another site Adhesar-north-west (Manigara) in the same location revealed chert based patinated Upper Palaeolithic artefacts along with microlithic industry. Kotia pottery along with early microliths, made on greyish chert were recovered from Adhesar west-II. A red ware sherd and a stone disc fragment were also reported from Ghaghwa.

The artefacts collected from Magha-II, on the right bank of Samarmara *nala* included Upper Palaeolithic and Mesolithic artefacts besides a stone disc.

Magha-III, also on the right bank of Samarmara *nala,* was characterized by an evolved microlithic industry made on chert, chalcedony, agate and carnelian. The finished tools included triangle only.

The pottery of Neolithic fabric, hand-made rusticated ware, represented by bowls and Upper Palaeolithic tools were also found at a site called Indari.

Three km south-west of Piparagaon, on the right bank of Adwa, to the south-west of Pokhara was located Chhatnahia. This site yielded evolved microlithic industry marked by several fluted cores.

Mudpeli, located on the confluence of Kahenjua and Ghaghwa, yielded coarse grey ware and red ware of Kotia type pottery and some microliths.

The artefacts from Deori, located to the north-west of Manigara comprised chert based painted Upper Palaeolithic tools. Another site Pandaria, to the east of the Patpara yielded red ware Kotia type pottery.

A number of megaliths located at Jhanna-Kevaljhar on Muralia *nala* yielded microliths, black-slipped and Kotia red ware. Besides from Khamharia on the left bank of Kahenjua, were collected the sherds of red ware and black-slipped ware of Kotia type.

38. EXCAVATION AT NADNER, DISTRICT SEHORE.— R. G. Pandeya of the Prachya Niketan, Centre of Advanced Studies in Indology and Museology, affiliated to Bhopal University (Bhopal), carried out excavation at Nadner with a view to ascertaining a clear horizon of mesolithic culture as also of late Sohan assemblage, besides imparting training to the students.

The River Narmada flows to the south and the south-west of the site where a trench (5x5m) was sunk on the western side, in close proximity to a modern Hanuman Temple. The digging revealed nearly two meter thick habitation deposit. On the basis of pottery and other finds this entire deposit could be divided into five periods ranging from 700 BC to AD 300.

From the deposit of Period I (700-500 BC), bowl and other fragmentary pieces of dull black-and-red ware; fragments of a jar having a carination below the rim, black-and-red ware sherds with painted white lines and strokes, sherds of a fine buff ware, sherds of black polished grey ware, fragments of pottery with brown slip and fine fabric were recovered besides a solitary piece of iron nail.

The deposit of Period II (500-400 BC) also yielded the white painted black-and-red ware pottery that continued in small quantity. Red ware with brown as well as red slip were predominant in this period. Fragments of coarse, thick and jet black vase and storage-jar have been found. Other sherds of black ware containing black slip on both the sides and of medium fabric were also reported. Also found were a few fragmentary bowls of red ware with chocolate slip and medium texture; sherds of red ware with red slip on both the sides and cups of dull red ware without any surface treatment along with the rim of a fine ocherous cup. Other finds comprised a few pieces of NBPW mostly of degenerated variety; black ware bearing black slip on both the exterior and the interior surfaces; untreated red ware sherds; red ware of medium fabric with slip, probably the fragments of a jar or vase; besides a large number of fragmentary coarse red ware jars and vases. Another interesting discovery was that of a tiny *handi* of black-and-red ware for some specific purpose. Antiquities from Period II comprised a flat terracotta bead, some iron objects, metal ring and a tiny glass bead.

From Period III (400-200 BC) were recovered a few pieces of black ware of medium fabric with black-slip on the exterior and the interior surfaces, besides a piece of untreated red ware having carination near the rim of fine texture; sherds of red ware with slip on both the sides; a cup of red ware with splayed-out rim, and flat bottom; fragments of red ware having carination in the lower portion meant for some specific use; thick jar of medium texture with exterior red and interior black; thick red ware with pinched pattern around the middle portion of the pot. Red ware with bright red slip is however, conspicuous. A few fragmentary cups and bowls of white painted black-and-red ware have also been found in this deposit. A few sherds with black-slip inside and chocolate outside were also recovered.

In Period IV (200 BC-AD100), four pieces of pottery, similar to Kushan ware have been found. These contained a fine texture and a rough surface with colours ranging from red to yellowish red. A fine slip was noticed on the red ware fragments of a dish or a large pot. During this period the frequency of black-and-red ware decreased considerably, but there was prominence of red ware and brick red ware of fine, medium and even coarse fabric with or without slip.

Among other antiquities of this period, mention may be made of a fragmentary ivory bangle and a shell knife of convex and crescentic shape.

In Period V (AD 100-300), potsherds with bright red slip have been found to continue along with other red ware pottery, though majority of them were dull in appearance. Also recovered were a few fragments of degenerated black-and-red ware of thick and coarse variety.

MAHARASHTRA

39. EXCAVATION AT PAITHAN, DISTRICT AURANGABAD.— P. N. Kamble, assisted by M. Mahadevaiah, M. R. Dhekane, D. N. Sinha, D. T. Asar, S. B. Rindhe, D. L. Sirdeshpande, G. L. Gaikwad, V. R. Satbhai, B. S. Tadvi and S. L. Magre, of the Aurangabad Circle of the Survey, in collaboration with the Society for South Asian Studies (The British Academy, London) represented by James Howell, assisted by his associates, jointly conducted excavation at Paithan. In the current season, only four trenches were laid in grid pattern, measuring 5 mx5 m, in a linear sequence along the east-west orientation.

During the course of excavation, two ring-wells of brick were exposed. Among other finds mention may be made of pottery, coins, beads, pendants, bangles, ceramic weights, gamesmen, figurines, hopscotch, skin-scrubbers, disc, wheel, plaque, lamp, ear-stud, smoke-pipe, toys, sling-ball, iron nails, arrow-head, ring, spear-head, copper anklet, blade, bell, kaolin figurines and bone points, comb and hair pin, mostly belonging to the medieval period.

40. EXPLORATION IN DISTRICTS CHANDRAPUR, NAGPUR AND YEOTMAL.— In continuation of the earlier work {*1994-95,* p. 55), G. L. Badam of the Deccan College Post-graduate and Research Institute, Pune, with the assistance of Vijay Sathe of the Department of Archaeology, Government of Maharashtra, carried out exploration and small-scale excavation in three districts. Two Pleistocene fossil sites were discovered and several fossils of large vertebrates and Palaeolithic artefacts were collected in stratified context as well as from freshly exposed sections.

Several small seasonal rivers and *nalas* within the radius of about 20 km of Warora (District Chandrapur) were explored to identify the areas of Palaeontological potential. However, a large number of fresh looking Middle Palaeolithic flakes, scrapers, made on chert were collected. Well known dinosaur site of Pisdura was also explored and several dinosaur and molluscan shell fossils were collected from the ploughed fields. These fossils were found in the Lameta Formation underlying the basalts. Some well-preserved Middle Palaeolithic scrapers were also discovered in the cultivated fields at Pisdura.

Explorations in the River Kanhan and its tributaries near Kamptee Contonment in District Nagpur, also revealed yellowish-brown silt and clay, overlain by the Younger Alluvium with a

thickness of about 2 to 4 m. A lateral extension of more than 2 km, both in lower as well as in upstreams of River Kanhan was noticed. Several calcium carbonate nodules were also found embedded in this unit. About 6 km upstreams of River Kanhan and near its confluence with the tributary River Kolar, exposed sections as well as the banks of these rivers yielded several Middle Palaeolithic flakes, scrapers and cores, mostly made on chert and chalcedony. One sub-fossil long bone fragment and two fossil bovid tooth fragments were also recovered. Further upstream, near the confluence, a few abraded Middle Palaeolithic flakes were also recovered from the exposed beds of another tributary, called River Pench.

Several fossilized cranial and post-cranial remains of *Elephas* sp., *Bos namadicus, Bos/Bubalus, Antilope cervicapra,* ? *Sus* sp. and gastropods of Pleistocene period were discovered for the first time in the cemented sheets of sandy pebbly gravel and yellow-brownish compact clay and silt on the right bank of the River Wardha at Jhola (20°07'30" N; 78°59'13" E), 15 km north of Wani, District Yeotmal. A fossil vertebra and limb bone fragment of *Elephas* sp., bovid post-cranials and an isolated well-preserved upper third molar of Antilope cervicapra were also discovered (for the first time) from the exposed sections on the right bank of River Wardha near village Rangna (20°08'07"N; 78°58'06" E), 3 km further upstream of Jhola. Litho-stratigraphy of the Quaternary deposits revealed cemented sheet of sandy pebbly gravel (SPG) as the basal unit overlain by yellow-brownish compact clay and silt (YBCS). Though both these units have yielded vertebrate fossils and fossil gastropods, the latter is comparatively rich in different species of gastropods. The fossils from cemented gravel might represent the evidence of abrasion and breakage as a result of pre-and post-burial taphonomic activities with proximity to the riverine situation. Yellowish silty clay with calcretes overlies YBCS, which is in turn capped by the Younger Alluvium. Examination of several exposed sections at Patala, Kona, Kawadi and Kunad (areas adjacent to the fossil sites and falling within the mining operations of the Western Coal Fields) revealed considerable uniformity in the general litho-stratigraphy of the Quaternary formations. Based on Palaeontological and litho-stratigraphical data, the deposits could be dated to the late Pleistocene period. With a view to assign a precise age to these fossiliferous deposits in this part of Wardha valley, fossil gastropods collected from subsequent litho-units are being sent for C-14 dating.

41. EXCAVATION AT DATTAWADI, DISTRICT NAOPUR.— The Department of Ancient Indian History, Culture and Archaeology, University of Nagpur, under the direction of Chandrashekhar Gupta and Ismail Kellellu, assisted by Pradeep Meshram, C.N. Saharkar, Damodar Aglave, Jagdish Ramdam, Mukta Mohite, Vandana Khedikar and the post-graduate students of the University, recovered ',. Middle Palaeolithic stone tools in the course of trial-excavations at Dattawadi (21 °5' N; 79 °9' E). This is a small upcoming suburb of Nagpur about 9 km from the zero milestone and 314 km from the University campus, Nagpur, on the right side of the Nagpur-Amraoti Road (NH-6). The site measures about 200x150 m and is about 200 m south-west of the road near the suburb. The whole tract forms a gentle gradient of interconnected low hills and forms the catchment area with the water draining out into a *nala.* At some places, the surface is dotted with eruptions of intertrappean smoky-white chert formations. The entire surface is littered with stone artefacts in different stages of manufacture, cores and debitage. The tools, made entirely on locally available smoky-white chert, are fresh and without any encrustations suggesting the site to have been a factory site.

Besides collecting tools from the marked places on the surface, three cuttings - DWD I, DWD II, and DWD III, have been taken up during the period under review, with a view to knowing the thickness of the tool-yielding deposit and tool types at these selected places.

DWD I, with forty-one meter square grids, was numbered in Arabic numerals from 1 to 10 east-west and English alphabet from A to D north-south. In DWD I, digging and scraping in each of the small grids laid on the southern slopes about 300 m away from the crescented hillock, revealed Middle Palaeolithic tools — finished or in the process of finishing, along with used and unused cores and waste flakes right from the surface. As it is not possible to excavate all the forty grids upto the natural soil because of time constraints, only six squares have been subjected to a thorough digging. Finely made tools comprising scrapers of different types, points, awls/borers, blades—all made on smoky-white chert have been recovered from these grids from an average depth of 0-35 m.

A 2mx2m cutting in DWD II was taken about 10m upwards of the slope from DWD I. This was slightly on a raised terrace where there was already a cutting made by the settlers. From this cutting also, tools were collected right from the top upto a depth of 65 cm. The frequency of the availability of tools became less and less as the cutting went deeper. At a depth of 79 cm not a single tool was found.

In DWD III, scraping of the western side of a deep rectangular well (10x8x5m), located about 200 m north-east of DWD I, was abandoned after digging to a depth of about 5m. A two metre wide section cutting in DWD III, revealed six layers.

Layer 1 : 40 cm thick, black cotton soil dumped at the edge of the well

Layer 2 : 20 cm thick, dark sandy-soil with gravel deposit, appeared to be a water-born deposit

Layer 3 : 55 cm thick, sticky black cotton soil with medium gravel

Layer 4 : 25 cm thick, medium to large-sized gravel-deposit with large-sized Middle Palaeolithic tools, interestingly made on brownish chert. The tool types included scrapers and points.

Layer 5 : 2 m thick, decomposed cherty deposit, followed by a basalt bed-rock in layer 6.

After a preliminary study of the tool assemblage, it has been observed that the blade element dominates the tool technique and most of the tools were larger than that of the usual Middle Palaeolithic tools; some measuring 9-1 x3-9x2-4 cm. A detailed study of tools and their techniques is in progress.

MANIPUR

42. EXPLORATION IN DISTRICT BISHENPUR.— The Department of Archaeology, Government of Manipur, in collaboration with the Department of History, University of Manipur, during the course of exploration, located a Neolithic site at Naran Siena and collected two Neolithic celts from

Sarangthem Tombi Singh. From Nachou, another site in the same district, were collected ancient Manipuri coins, human bones, beads, bronze ornaments, besides globular earthen pots.

43. EXPLORATION IN LAPHUPAKPI, DISTRICT IMPHAL.— The Department of Archaeology, Government of Manipur, in collaboration with the Department of History, University of Manipur, conducted a small-scale excavation at Laphupakpi at the foot hills of Nongmaiching hill, 11 km to the east of Imphal. Ruins of a rectangular masonry brick structure was exposed, covering an area of 9x4-7 m with six steps tapering upwards, forming almost a platform (1-5x1-7 m) at the top.

44. EXCAVATION AT KHANGABOK, DISTRICT THOUBAL.—The Department of Archaeology, Government of Manipur, under S. Bhegiya Singh and K. Indrani Devi, assisted by Jibanlata Devi, N. Kumar Singh, K. Gunindro Singh, L. Ibomcha Singh, M. Bijoy Singh and N. Jiten Singh, carried out excavation at Khangabok (93-98° E; 24-55° N) with a view to ascertaining the cultural sequence and studying the ethno-archeaology of the site also called Murali Lampak (burial-ground), situated 27 km to the south of Imphal, in the campus of Khangabok Maisnam Leikai Boy's Primary School. Earlier, while levelling the mound for the school building many grave goods comprising beads, bronze rings and plates, bones, potsherds, were recovered. The excavation revealed only the secondary pot-burials with fragments of skull and bone, with one to three pots for each burial, all hand-made, decorated at times, in addition to the pots of medium-size, covered with ring-footed bowls as lids or bowls. The grave goods comprised iron objects (pl.XVB), such as varieties of knives, bronze rings, ear-rings and beads. Atleast four to six thin bronze plates were found with each burial, perhaps used as an offering. Among other noteworthy finds, mention may be made of glass and paste beads, *hookuhs* in terracotta and stone, besides terracotta net-sinkers and long necked-globular pot. Two square bell metal coins of Maharaja Garibnawaz (AD 1709-48) were found as stray finds.

MEGHALAYA

45. EXPLORATION IN WEST DISTRICT, GARO HILLS.— In continuation of the earlier work *(1992-93,* pp.75-76), H. C. Sharma, A. A. Ashraf, S. K. Roy and a batch of M. Sc. final year students of the Department of Anthropology (Prehistoric Archaeology), Guwahati University, carried out exploration in the West District of Garo Hills. The work was primarily confined to the areas in and around Tura and Arbella ranges in the valleys of the Rivers Ganol, Rongram and Selbal. The area contains serrated hill ranges, narrow valleys and deep gorges ranging in height between 450 m and 650 m approximately.

The above rivers formed mostly unpaired terraces on either banks which are presently occupied either for cultivation or for habitation by the local people *viz.,* the Garos. Altogether fourteen sites were explored by the same Department.

The sites contained lithic tools of Middle and Upper Palaeolithic period, Mesolithic tools in the form of small axes with lanceolate-tip and butt, primarily found in South-East Asia.

The tools were found mostly in the eroded hilltop, eroded hill ridges and the abandoned Jhum fields. In fact, tools from Mismagre III, Didami III and Miching Grenchep were recovered

from the road cutting sections. Most of these sections were explored on the banks of the streams. The stratigraphy shows that the tools were associated with gravelly/bouldery clay/silt deposited above granitic/gnessic beds. The thickness of the tool yielding layer, overlain by a thin humus, ranged between 8-10 cm.

The tool types collected from the above sites included cleavers, large scrapers, side/round/ end scrapers, points, borers, knife, cores, blade flakes, lanceolate, axes, awl, hammer, choppers, handaxe, discoids, pick-axes, etc.

46. EXPLORATION IN THE DISTRICT JAINTIA HILLS.— A. Jha, assisted by Bimal Sinha and T. K. Srivastava, of the Guwahati Circle of the Survey, during the course of exploration, noticed a number of menhirs and orthostats, locally known as table-stones (a bench-like construction made with the help of stone-slab fixed on four or six uprights, one each placed at the corners and the middle portions at Nongphow, Pdengshakap and Amlari. The monuments of this type are being constructed in the region even today to commemorate the important events which are considered to be sacred by the locals.

ORISSA

47. EXPLORATION IN DISTRICT BOUDH.— During the course of exploration in District Boudh fourteen Mesolithic sites *viz.,* Khuntiapara, Jogibhugra, Maryakud, Dhalpur, Isisinga, Baghiapara, Paljhar, Bankapara, Jharasahi, Krsnamohanpur, Pargalpur and Boudh proper, were located in the Mahanadi and Salunki valleys on the tributary of River Mahanadi by Balaram Tripathy, Research Scholar of the Department of Archaeology, Deccan College Post-graduate and Research Institute, Pune. A few among these were the manufacturing sites, while the rest were secondary sites. The sites resting on a thick deposit of red soil, were located in the erosional *nalas* and in the foothill zones. The principal raw material used in manufacturing the microliths were chert and chalcedony besides some quartz, but chert was more common. In addition, heavy duty tools, like cores (including horse-shoe core), chopping tools, ring-stones and hammer-stones were also found along with the microliths.

Blades (both retouched and parallel-sided), bladelets, scrapers (both thumb-nail and end-scrapers), points, lunates, borers and hammer-stones constituted the main tool types found in this area.

Two early historical mounds were also discovered, namely Maryakud (a small island in the River Mahanadi) and a trial-trench (lxl m) was also taken up in the periphery of the mound. Partly disturbed by the river erosion, the site has an area of 25 m in length and 30 m in width. From the surface a large number of potsherds of black-and-red ware, grey ware, black polished ware, red ware (applied with a thick red slip) were recovered, besides a large number of fragmentary storage-jars, globular pots, bowls, dish-on-stand, lids, pot with ledge and a flat base. A variety of black ware with incised circular patterns and a black coat on the reverse, was also found. Some of the potsherds contained circular line marks in the reverse. Most of the pottery were hand-made while the rest were made on a slow wheel. From the surface of the mound, a few pieces of iron slags have been recovered, suggesting the iron smelting activity in the region and its trade link with other parts of Orissa. From the trial-trench, black-and-red ware of both thin and thick variety, red ware

with a thick slip in red ochre were found. Also noticed were a few bone pieces (all charred) and a patch of charcoal.

Maryadpur is another site, partly disturbed due to the erosion of River Salunki, a tributary of Mahanadi, as also due to the proximity of the confluence of both the rivers. This site yielded a few potsherds of red ware, all hand-made.

48. EXCAVATION AT BARABATI FORT, DISTRICT CUTTACK.— In continuation of the earlier work *(1994-95,* pp.59-60), K. Veerabhadra Rao of the Excavation Branch-IV, Bhubaneswar, of the Survey, assisted by A. K. Patel, M. P. Singh, R. N. Sahoo and S. K. Bhoi, resumed excavation on the northeastern corner of the mound and exposed the eastern end of northern retaining wall of the citadel (pl.XVIA) belonging to Period III (AD 1560-68). The wall was built of dressed laterite blocks with mud-mortar; each block measuring 85x8x22 cm on an average. The exposed portion comprised only eleven courses and was badly damaged due to robbing of stones. Complete exposure was however, not possible as it was buried under a residential quarter, found in the northeastern corner of the mound. The portion of the wall running below the residential quarter contained only three courses. Inner side of this wall was uneven with the courses lying out-of-plumb while the battered outerside was lime-plastered. South of the wall referred to above at a distance of 3-55 m and 17 cm below it, a *homa-kunda* (pl.XVIB), roughly square on plan, measuring 1 0x1-8 m with four courses was also found. The thickness of the wall of *homa-kunda,* equal to the breadth of the brick, measured 20 cm while in length 32 cm. The available portion contained six courses on the eastern side and four on the northern side. The northeastern corner was badly damaged. Charcoal and ash were found from the *homa-kunda.* This belonged to Period-II *(circa* fourteenth century) and was separated from the floor of Period I by a thickness of 80 cm. South of the wall, at a distance of 3-55 m, was traced a *homa-kunda* (1-0x1-8 m) at a depth of 17 cm, belonging to Period II *(circa* fourteenth century). This was roughly square on plan with four courses. The thickness of wall of the *kunda* was 20 cm with a length of 32 cm. There were remaining six courses on the eastern side and four on the northern side. The northeastern portion was found badly damaged. From the *kunda* which was separated from the floor of Period I by a thickness of 80 cm, were obtained charcoal and ash.

Further north of the retaining wall, a trench (2x2 m) was taken up to ascertain the extent of structures. It revealed a wall, built of dressed laterite blocks extending towards east.

East of the watch-tower, where the floor level of the Palace was exposed earlier, a 'IP shaped laterite structure (pl.XVIIA) was traced in a trench at a depth of 3-24 m below the floor level. This was built of dressed laterite blocks of considerable length while small stones of varied dimensions were used for filling up of each course, 3 m wide. This structure was contemporaneous with the heavy foundation columns of the Palace and was probably used for a staircase. The remaining floor above the mound was also exposed and documented. It was evident that after placing a course of Khondalite stone, the dressed laterite blocks were laid.

The digging in the southern side of the Mazhar to trace the western extension of the structures of the Palace-complex, revealed a drain at a depth of 1 12 m, oriented north-west and south-east.

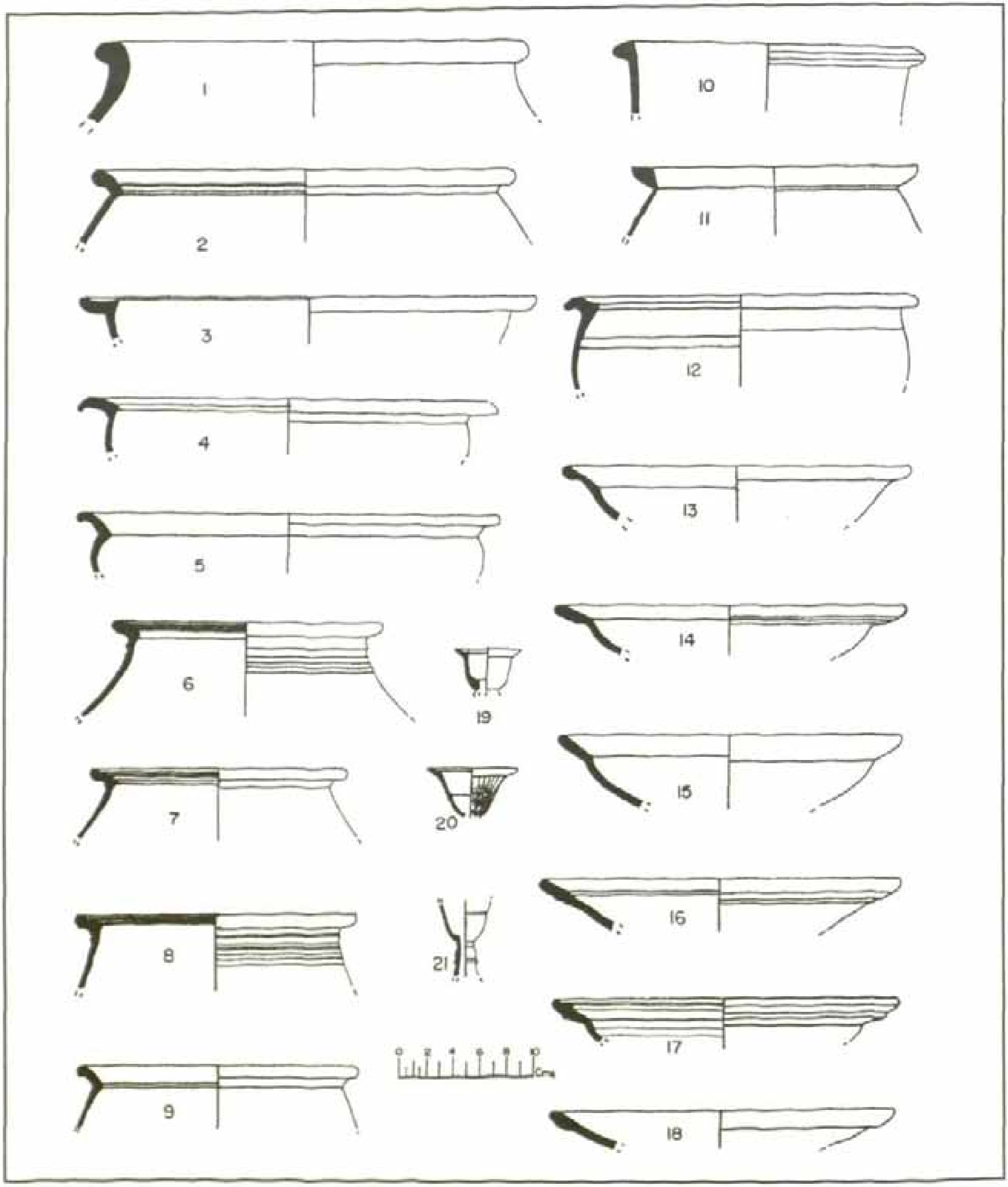


Fig. 8. *Barabati Fort : pottery types*

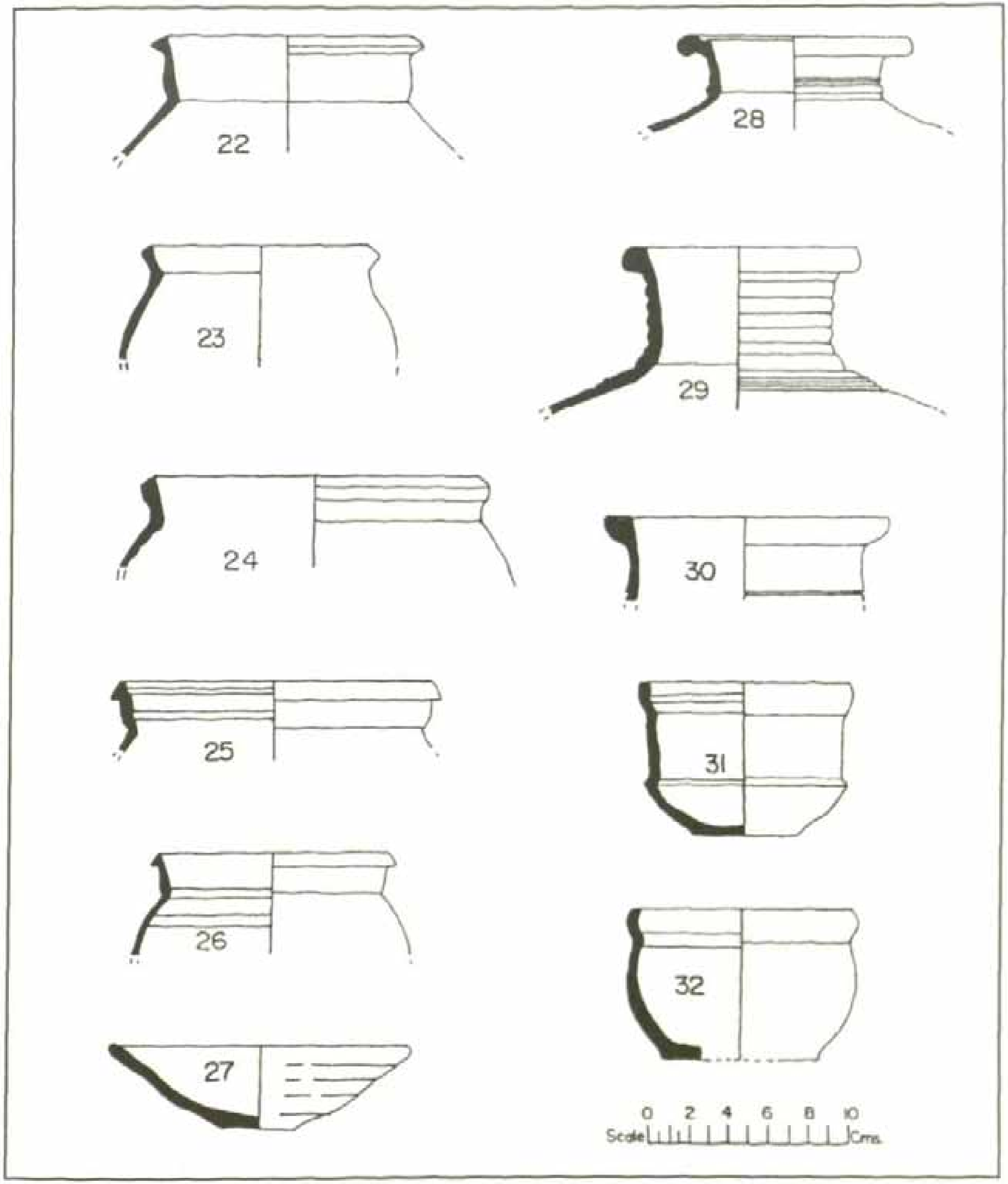


Fig. 9. *Barabati Fort : pottery types*

It was built of dressed khondalite blocks, laid over a foundation of laterite blocks, along the length of the drain with channels cut into them. The channel was also plastered. The drain could not be pursued because of encroachment on the northern side. In the second quadrant of the same Trench-XJ-7, a structure resembling the foundation of a wall was found in three courses, laid alternately along the length and across it with khondalite blocks, measuring 84x31x24 cm. The area was extensively filled up with stone blocks, rubble, etc., and was reclaimed before the construction of the above structures.

Apart from a large number of architectural fragments which were handed over to the Conservation Assistant, Sub-Circle, Cuttack, for use in restoration work during conservation of the excavated site in future, mention may also be made of a copper coin (pl.XVIIB), bearing the legend Shah Alam Badshah Sanah Julus 37 identified with Shah Alam-II (AD 1759-1806) on the obverse, and *ekpai sikka* (Bengali), *ekpaisa* (Persian) and *ekpai sikka* (Kaithali?) on the reverse. It does not however, bear the name of the mint. Hand-made terracotta figurines of animals (pi.XVIII) prepared by merely pinching a lump of clay were also found. These are very crude and devoid of any artistic quality, perhaps formed part of a ritual for votive offerings to the local goddess on wishfulfilment or purely used as toys. The context of their occurrence on the western side of the citadel gives credence to their being only toys.

Also noteworthy was a female sculpture in high relief, standing in *tribhcmga,* holding probably a branch of tree (pl.XVIIC). Both the hands and right leg below the knee are damaged. Decorated with ear-studs, resembling flowers and a waist band composed of beads which appear on both sides of the hip. The wavy lines on the background, point to a flowing diaphanous cloth to drape her body. The pottery (figs.8-9) recovered from the southern side of Mazhar comprised sturdy grey ware, dull red ware, all wheel-made and well-fired but without any decoration, with shapes like vases, *handis,* bowls, shallow bowls, lid-cum-plates and *hookahs.* The shallow lid-cum-plates were available mostly in red ware with slip applied only on innerside. As the material were collected from dumps, no definite date could be assigned to the objects, but on the basis of similarity, these might belong to Period I *{circa* thirteenth century).

RAJASTHAN

49. EXCAVATION AT BALATHAL, DISTRICT UDAIPUR.— In continuation of the earlier work *{1993-94,* pp.93-97), excavation was resumed by V. N. Misra, Vasant Shinde and R. K. Mohanty of the Deccan College Post-graduate and Research Institute, Pune and Lalit Pandey and Jeewan Kharakwal of the Institute of Rajasthan Studies, Rajasthan Vidyapeeth, Udaipur, assisted by S. A. Pradhan, D. D. Phule, B. B. Dighe and D. Karanjkar, V. G. Vishwasrao, Sunil Jadhav, Kurush Dalai, Anup Mishra, Abhijit Dandekar, Balaram Tripathy and Rhea Mitra, M. D. Kajale, P. K. Thomas, P. P. Joglekar, Malti Nagar and Ajay Dandekar, besides the post-graduate students of the Department of Archaeology, Deccan College and diploma students of the Institute of Rajasthan Studies, Tama Panda of the Department of Archaeology, Calcutta University and Pradhan and Mahanta of the Department of Anthropology, Utkal University, as trainees, with two major objectives : to clarify the cultural affiliation of the fortified structure partially exposed in the previous two

seasons as also to expose fully the Chalcolithic structures found in the southern part of the settlement in the previous seasons.

The area of excavation was enlarged by 500 sq m by opening twenty-nine new trenches of 5x5 m each. Some of the trenches were excavated completely while others partially. Besides, digging was continued (fig. 10) in five previous trenches (A, D2, OA, OB and OC). To realize the second objective, digging was done in several trenches to the north and south of Structures 10 and 11, partially exposed in the last two seasons. Besides, the northern half of Trench CY1 was opened to expose the plan of the potter's kiln noticed earlier.

The most spectacular discovery at Balathal is a fortified mud and stone structure (No. 4) located in the central part of the mound. On the basis of stratigraphy of Trench F4, exposed in the first two seasons, this structure was assigned to the early historic period. But the stratigraphy in this trench was highly disturbed due to large-scale dumping of burnt cow-dung. However, a strong doubt persists about this preliminary inference because the early historic period was very poor in structural evidence. On the other hand, the Chalcolithic period revealed very large stone, mud and mud-brick residential structures. Therefore, the fortified structure appeared more in conformity with them. This season's digging in Trench H4, on the outer side of the northern wall, and in Trench A, on the southern side of the southwestern bastion, conclusively proved that the fortified structure belonged to the Chalcolithic period and not to the early historic period.

It was already known from the stratigraphy of Trench F4, excavated during the previous two seasons, that the foundation of the fortified structure stood over the Chalcolithic deposits. However, this year's digging in Trench Nos. H4 and A showed that the Chalcolithic deposits rested against the outer walls of the structure right up to the top and therefore, proved that the construction of the structure was older than the layers resting against it.

Digging in Trench H4 revealed that the outer wall of the fortified structure had a height of 4 m which had been repaired on more than one occasion. The wall rested against a strong mud and mud-brick platform which was probably constructed as a support for it. However, because of the limited area excavated, the size and thickness of the platform is not yet fully clear. The digging further revealed a north-south running wall which joined the outer wall of the fortified structure. The foundation of the extension wall is made of large blocks of granite and gneiss set in mud-mortar and it broadens gradually towards the base. Above the foundation, the wall is made of mud-bricks and is exposed to a length of 230 m. It has a width of 1 -80 m and has survived to a height of 75 cm. This unusually thick and strong wall does not appear to be the foundation of an ordinary dwelling structure. It may be a part of a wall enclosing the settlement or may be a part of another massive structure. However, its true function could be ascertained only after it is fully exposed.

Such fortified structures are known to have been built, before the Iron Age, only by the Harappans. This is the only Chalcolithic site outside the Harappan domain which has produced such evidence. The presence of massive baked-brick walls at Gilund in District Chittaurgarh, which is a much bigger Ahar culture site, suggests that this settlement also probably had a fortification.

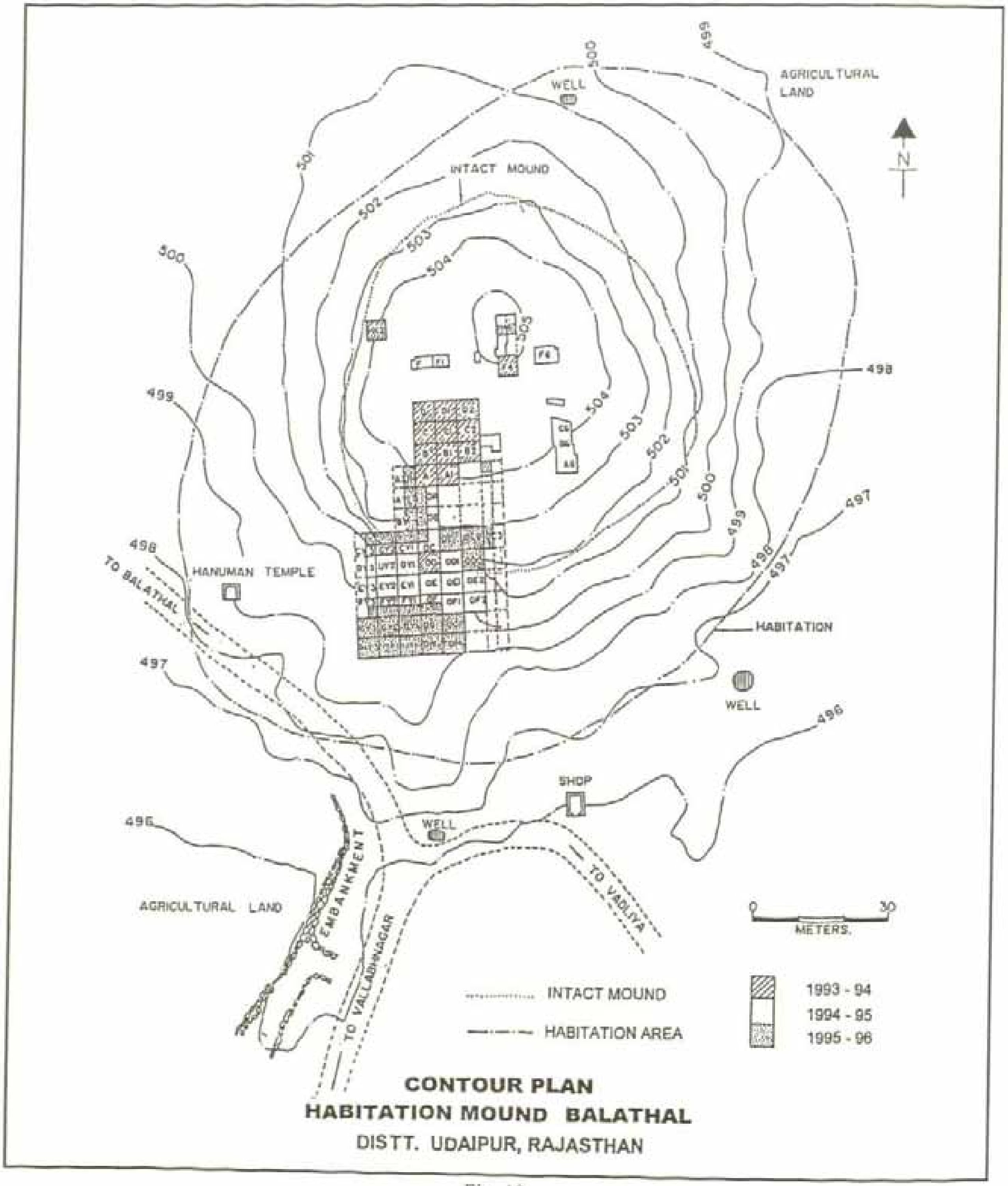

AGRICULTURAL LAND
WELL
N
INTACT MOUND
HANUMAN TEMPLE
TO BALATHAL
HABITATION
WELL
SHOP
WELL
EMBANKMENT
AGRICULTURAL LAND
TO VALLABHNAGAR
TO VADLIYA
0 30 METERS.
INTACT MOUND
HABITATION AREA
1993 - 94
1994 - 95
1995 - 96
CONTOUR PLAN
HABITATION MOUND BALATHAL
DISTT. UDAIPUR, RAJASTHAN

Fig. 10

To the south of the fortified structure, three structural complexes, belonging to the structural phase II, have been found. Complexes 1 and 2 were partially exposed in the previous seasons and the third one was unearthed during this season on the southern side of Structure 9.

The third complex (pl.XIXA) consisted of four structures (Nos. 11, 13, 14 and 15). Of these, Structure 11 is the largest one and the remaining three are located within it. Structure 11 is a large rectangular enclosure, covering an area of atleast 280 sq m. Its northern wall, running east-west is 11 -80 m long, 80 cm board and has survived to a height of 80 cm. The eastern wall, running north-south is 16-50 m long. It projects to the east for a length of 130 m at a distance of 4-90 m from its northeastern corner.

Near this corner there is 1-20 m gap which probably served as an entrance. Of the southern wall only a small portion of 2-20 m has survived near the eastern corner. Two circular silos were located inside the structure, one near the entrance and the other 2-40 m to the south-west of the first one. Structure 13, located in the eastern half of Structure 11, was roughly squarish in shape, being 5-60 m long (east-west) and 5-20 m broad (north-south), but with rounded corners. Its walls were made of mud and mud-bricks and were plastered with mud and cow-dung. A roughly circular pit, measuring 2-0x 1 -70 m, was located in the central part of the structure. It contained a large heap of ash and the earth below and around it was heavily burnt. It could be the common hearth of all the dwelling units within the complex. Located to the west of Structure 13, was the Structure 14, rectangular in shape and represented by only three walls, the southern wall being absent. The northern wall, running east-west was 5-20 m long and 70 cm wide. The eastern wall was 4-70 m long, joined to the northwestern corner of Structure 13. The western wall survived to a length of only 2-90 m and a width of 70 cm. The floor of the structure was made of mud and plastered with cow-dung. No other features like domestic hearth or storage facilities were found inside it.

Structure 15, located on the western side of Structure 14, was roughly circular on plan, with a maximum diameter of 2-60 m. Its walls were made of mud and their average thickness was 40 cm. On its southern periphery there was thick fallen debris comprising mud and burnt clay lumps, suggesting that the structure was destroyed by fire.

Complex 1, comprising Structure 10, exposed partially in the previous season, was followed on its northern side towards the fortified structure. Room 10D, located to the north of 10C, is 11-50 m long and 2-80 m wide. It was enclosed on all four sides, with no visible entrance. Room 10G, located on the eastern side of 10D was exposed partially (fig. 11; pl.XIXB). There was little evidence of living activity in these rooms and most probably they were used for storage, perhaps as granaries.

Structure 16, belonging to the Structural phase III, located above Structures 10F and G and consisted of two rooms, 16A and B (?). Of Room 16A, only the north-east portion was intact. The wall, dividing the structure into two parts, was 4-30 m long and 65 cm wide. On the southern side of this wall there was a stone platform at a slightly lower level. It was 2-80 m long and 51 cm wide.

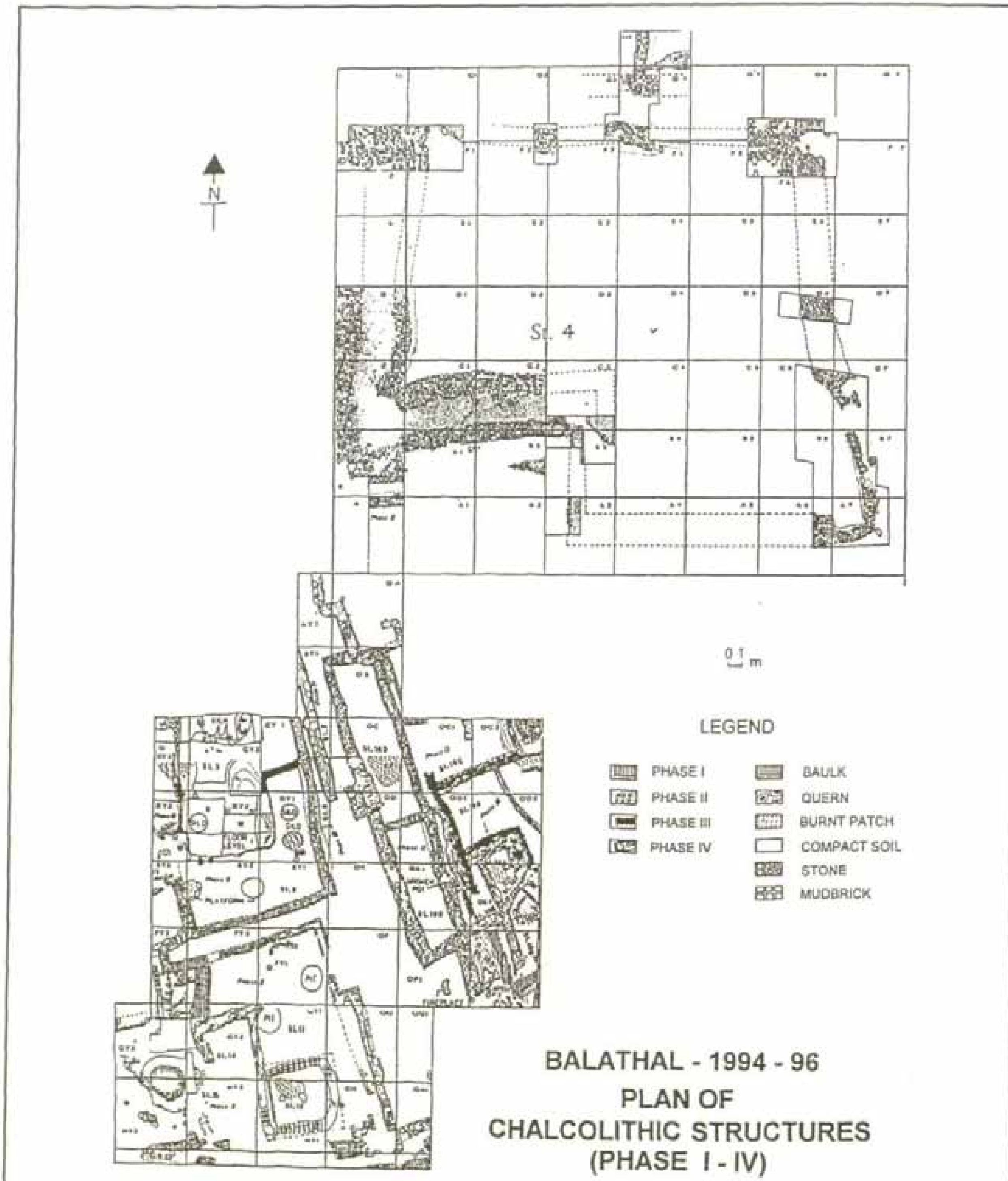

N
St. 4
0 1 m
LEGEND
PHASE I
PHASE II
PHASE III
PHASE IV
BAULK
QUERN
BURNT PATCH
COMPACT SOIL
STONE
MUDBRICK
FIREPLACE
BALATHAL - 1994 - 96
PLAN OF
CHALCOLITHIC STRUCTURES
(PHASE I - IV)

Fig. 11

The eastern wall of this room survived to a length of 2-55 m, a width of 65 cm and a height of 70 cm. Along the inner side of this wall there was a stone platform. It was 1 -90 m long north-south and 1-15 m wide east-west. In the northeastern corner of this room a large saddle quern was found.

Room 16B, roughly rectangular on plan was 5-50 m east-west and 400 m north-south. Parallel to the northern wall there was a stone platform, which was 3-90 m long and 1 05 m wide. The entire structure appeared to be dipping gradually towards the eastern part. No features like domestic hearth or storage facility were found within the structure. The main activity area of the structure appeared to be on the outer side, to the north, as suggested by burnt patches of earth and a circular platform. Two large fire-places have been found in this area. Both were circular on plan with an approximate diameter of 1-40 m and appeared to have been used over a long time as indicated by burnt clods of earth. A circular stone platform, with a diameter of 1 -75 m and a height of 40 cm, was located close to the fire-places. This platform probably supported a storage-bin.

In the eastern half of Trench OA was noticed the basal course of a stone structure (No. 18) at the base of layer 13. It belonged to Structural phase IV, represented by only two walls — eastern and southern. The characteristic feature of this phase was the use of large boulders of different shapes in the construction of foundations, the eastern wall of the structure runs slightly in a north-west and south-east direction which survived to a length of 3-55 m, only in its basal course. The northern wall, running in an east-west direction, also survived to a length of 1 -65 m with an average width of 70 cm.

The pottery kiln discovered during the last season, was exposed on its plan. It was enclosed between two north-south running walls made of mud-bricks. The kiln, oval on plan contained several elongated and interconnected channels, provided for letting out the gases. The channels run both east-west and diagonally north-south (pl.XXA). A part of the kiln extends into the northern section. An unusually large stone quern, with heavily used surface, was found by the side of the kiln. It was probably used for kneading clay.

A large, roughly rectangular fire-place was noticed in one of the rooms of Structure 10 in layer 16 at a depth of 5-06 m. Considering the intense burning and the presence of a large number of pottery pieces and the remains of burnt clay wall, it might represent a potter's kiln. As the kiln was exposed only on plan, its architecture, depth and contents were not known. The exposed portion of the kiln was 3-75 m (north-west and south-east)x200 m (east-west).

Layer 13, sterile in nature, representing a gap between Chalcolithic and early historical periods, was confined to the southern side of the fortified structure in the area where early historic occupation was present. It was probably formed by weathering of the sediments, deposited as a result of aeolian activity, after desertion of the site by the Chalcolithic people. Its absence on the northern and western sides of the mound might be due to the erosion of the natural sediments, since they were not covered by later habitation. Another possible explanation could be that the deposit of this layer was laid by the early historic people who reoccupied the site after its abandonment by the Chalcolithic people. Probably the newly arrived people noticed a sloping depression on the southern side of the mound and filled it with black soil from the surrounding fields to create a levelled

surface for their settlement. This probably would explain the steadily increasing thickness of the layer towards the south.

Pottery found during the excavation was largely similar to that of the last year. No new fabric was found but a few new shapes and designs were noticed, while other finds included a knife and butt of a celt in copper, terracotta discs (both perforated and unperforated), wheels, bull and dog figurines, and bangle pieces, a few microliths, bladelets and associated debitage, stone querns, mullers, hammer stones, sling-balls, beads and pendants of semi-precious stones. Large quantities of animal bones and some charred grains were also found.

On the basis of first two season's excavation, it was thought that there existed an Early Iron Age occupation at the site, antedating the beginning of the historical period. This hypothesis was based on the data obtained from the Index Trench F4, the stratigraphy of which was highly disturbed. However, the stratigraphy exposed above and outside the fortified enclosure, ceramics and other objects now clearly revealed that the re-occupation of the site took place only at the beginning of the Christian era. This revised chronology was supported by the discovery of two terracotta seals with bullock carts embossed on them (pl.XXB) which were similar to the seals reported from Satavahana and Kshatrapa levels elsewhere. Copper coins characteristic of the first century BC-AD found in this level also confirmed this chronology. There was therefore, no separate Iron Age phase at the site preceding the early historic settlement.

The early historic occupation was confined only to the southern part of the mound. In this period one roughly oblong stone structure (No. 12) and a number of broken walls were encountered. Being located on the slope of the mound, the oblong structure was exposed almost on the surface, measuring 4-55 m north-southx4-20 m east-west. Its base was made of flattish stones set in mud-mortar and the wall was made of stones, two courses of which have survived on the northern side. For want of pottery and other objects, the exact function of the structure could not be determined. It could possibly have been a granary.

In the southwestern corner of one of the rectangular rooms, a terracotta drainage pipe line was found (pl.XXC). The pipes are 56 cm long and 23 cm in diameter. The area around the pipe line was covered with flattish stones. Except Structure 12, no complete structure was encountered as the excavated area was small. Two iron smelting furnaces, circular in shape and with conical top, were found on the southern side of the four furnaces found in the first season.

Pottery of this period was mostly coarse red and grey wares, occasionally decorated with incised and applique designs. A large number of iron lumps and objects comprising projectile points, blades, adzes, rods, nails, drills, points, hooks, clamps and angles and a complete plough-share were found. Ornaments included a large number of glass bangles, a few bangles of terracotta and ivory/bone and a couple of them made of shell, beads of semi-precious stones, glass and terracotta. Other terracotta objects comprised animal and human figurines, ear-studs, lamps, weights, cylindrical pieces, sticks, skin-rubbers, cakes, discs and sling-balls. Stone objects included querns, mullers, hammer stones and sling-balls.

TAMIL NADU

50. EXCAVATION AT TIRUVERKADU, DISTRICT CHENGAI M.G.R.— S. Gurumurthy of the Department of Ancient History and Archaeology, University of Madras, assisted by A. Ekambaranathan, R. Ponnusamy, M. Seran and P.D. Balaji, carried out excavation at Tiruverkadu, 19 km west of Madras. Two trenches (TVD-1 and TVD-2), each measuring 6x5 m, were laid in the mound spread over a five acre area with a height of 3 to 4m and formed the eastern bank of the River Coovum. TVD-1 laid to the north-east of a Siva temple called Vedapurisvarar, revealed a deposit of about 2 m, whereas TVD-2 laid to the south-east of Vedapurisvarar Temple in a mangrove comprised a deposit of about 2-50 m. Both the trenches were excavated upto the natural soil. In both these trenches were noticed altogether five and ten layers respectively. In TVD-1 natural soil was noticed at a depth of 1-75 m whereas in TVD-2 natural soil was traced at a depth of 2-60 m. Both the trenches contained compact and ashy deposit with some disturbance. The finds comprised mainly the sherds of black-and-red ware, black ware, red-slipped ware, orange-slipped ware and coarse red ware, besides a number of spouts and knobs. Fragments of locally-made conical storage-jars were also collected from the deposit. Similar such storage-jars were found *in situ* in large number at Kanchipuram.

Among the antiquities, mention may be made of terracotta objects such as head of a royal person, figurine of Ganesa (ht 7 cm), datable to *circa* thirteenth century, ear-ornaments, beads, spindle whorls, and hopscotches; glass objects like beads and bangles, besides copper ring and coins in addition to a few unidentifiable iron pieces.

Particularly in TVD-2, in the lower level, a number of animal bones and teeth were collected. At a depth of 1-34 m skeletal remains of an animal were found in an alignment, thereby indicating it to be an animal burial. In the same trench two habitational levels were noticed at a depth of 0-73 m and 0-82 m respectively. In both the levels a number of pottery vessels were found *in situ* in inverted position and crumbled state, perhaps suggesting the desertion due to natural calamity.

On the basis of the pottery and antiquities obtained from the site, the deposit could be divided into three periods with a sub-divisiorr in Period-I, i.e., IA-IB, Period II and Period III.

Period IA (400 BC-AD 200) revealed the sherds of black-and-red ware, black ware and amphorae while Period IB (AD 200-600), represented a transition phase, i.e., from Iron Age to early historical period, characterized by the presence of orange-slipped ware and red-slipped ware, besides a few sherds of black ware. Period II (AD 600-1200) represented a huge deposit marked by a coarse red ware and survivals of red-slipped ware, belonging to the early medieval phase.

51. EXPLORATION IN DISTRICT NAGAL QUAID-E-MILLETH.— Under the direction of S. Gurumurthy, the staff members and the post-graduate students of the Department of Ancient History and Archaeology, University of Madras, intensively explored some pockets in Tarangambadi taluk. During the course of exploration, in the village called Kurangupittur, situated 15 km east of Mayiladuturai (Mayavaram), a mound was noticed, spread over an area of one square km with a height of about 3 m. The surface exploration of the mound yielded potsherds

belonging to black-and-red ware, black ware and red-slipped ware. Besides, a few iron slags were also collected. The material evidence collected from the surface of the mound indicated that the site was under occupation form the early historical period to the late medieval times.

52. EXPLORATION IN DISTRICT NORTH ARCOT-AMBEDKAR.— Ajit Kumar of the Madras Circle of the Survey, recorded the following antiquarian remains in the course of village-to-village survey.

Taluk	*Village*	*Nature of remains*
Arcot	Arumbakkam	Lower and Middle Palaeolithic tools
-do-	Athiyanan	Loose images of Uma-Mahesvara, Devi and Siva, datable to *circa* sixteenth-seventeenth century
-do-	Chinnasamudram (Mantangal)	*Linga* of late medieval period
-do-	Kirambadi	Temple of *circa* seventeenth-eighteenth century
-do-	Mechcheri	Siva temple with inscriptions in Tamil characters of twelfth-thirteenth century
-do-	Mulluvadi	Temple of late medieval period
-do-	Nethappakkam	Two temples *of circa* seventeenth-eighteenth century
-do-	Periyamangalam	Ruined temple, loose sculpture, inscriptions, habitation site of *circa* sixteenth-seventeenth century
-do-	Sembakkam	Late medieval habitation
-do-	Sittanthangal	Two ruined temples of Chola period with loose sculptures of Dakshinamurti, Karttikeya, *linga* with *yoni-pitha* and Vishnu with two consorts
-do-	Velur	Temple of *circa* seventeenth-eighteenth century

53. EXCAVATION AT GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— In continuation of last year's work {*1994-95,* p. 67-69), the Madras Circle of the Survey, undertook excavation and simultaneously conservation of the excavated structures at Gingee under the direction of B. Narasimhaiah, assisted by P. S. Sriraman, V. Sarangadharan, S. Ashok Kumar and T. Samuel Jashua. The aim of this season's work was to conserve the excavated structures in the mound in front of Kalyana Mahal and to further expose the Audience Hall that was partly exposed in an earlier clearance work.

The excavation revealed the existence of an Audience Hall and an adjacent Council Chamber. The Audience Hall, oriented north-south had two divisions. The southern portion (27-5x20-75 m) accommodated the ornate dias for the throne whereas the northern portion raised in four levels possibly for the court.

At the centre of the southern portion was the ornate dias for the throne. The dias (8-00x8-00m), built of well-dressed granite stones comprised the mouldings of *apattika, adhokumuda, kantha, tripatta-kumuda,* a broad *kantha, kapota* and a *vedi.* The top was covered with a massive, highly polished granite slab (5-15m square). A cylindrical back rest (2-65m in length and 2-35m in circumference) of highly polished granite was placed over this slab. Considerable amount of energy was spent in constructing this dias as it was not so easy to quarry, transport and finish the members.

On the two sides, east and south of this portion, was a low raised platform with pillar-bases. Interestingly, there were no such bases in the middle as they could obstruct the view of the ruler. A closed drain originated from this portion to join probably the main network of drains. This drain served the purpose of disposing the fluids, an integral part of several ceremonies connected with the kingship, and was always considered to be sacred.

There were four entrances leading to this area, of which through the east, one could enter the hall directly from outside. While the entrance from the south, protected by a screen-wall, led to the Council Chamber. There was a spiral staircase set in the thick masonry of the western wall leading to the private chambers of the ruler. The last entrance with the flight of steps led to the so-called 'Horse Stables'. It appeared that the spiral staircase and the entrance to the Council Chambers were for the exclusive use of the ruler.

The northern portion, where the court might have assembled, rose in four levels. The lowest landing (14-30x22-75 m) was at a height of 0 -15m from the area, reserved for the ruler. The second landing was at a height of 0 -75m from the lowest landing and projected on the eastern and western sides of the lowest one. There were flight of steps at three places to reach this landing. There was one more flight of steps axially aligned to the dias but was closed later on by raising the level to that of the landing. A huge polished granite slab (2-40x1-30m) was paved. Possibly this was the place where the dignitaries addressed the rulers. Curiously, there was a tank (2-40x2-60x 1 -45m) of brick masonry with a circular groove on its floor, located on the northeastern corner of this landing, the use of which could not be known.

There were two flights of steps, placed at the lateral ends to ascend to the third landing (6-35x22-40m) and raised by 0-80m. Similarly, there was a fourth landing as indicated by the flight of steps located at either lateral ends of the third landing. This however, was completely disturbed. This hall was separated from the 'Horse Stables' by a lime-floored passage.

The Council Chamber was located to the south of the Audience Hall. This chamber (36-45x8-60m) had a raised platform (8-60x9-30x 1 00m) across the width at the rear. There were two flights of steps at either end of the platform in addition to two steps of granite in front of it. In front of the platform is a pillared-hall. There were three entrances to this hall. One from the Audience Hall as mentioned above, the second, partially exposed, led towards the 'Elephant tank' and the third ascended to the private

56. EXCAVATION AT SRAVASTI (MAHETH), DISTRICT BAHRAICH.— In continuation of the earlier *(1993-94,* pp.104-105) work, the Excavation Branch III, Patna, of the Survey, under L. C. Singh, assisted by B. Nath, R. K. Sinha, D. K. Singh, N. K. Sinha, P. C. Dass, S. K. Gupta, Y. S. Nayal and S. K. Arora, in collaboration with the Archaeological Research Institute, Kansai University, Japan, led by Y. Aboshi, resumed digging with a view to ascertaining the habitational pattern besides the antiquity of the site near Khairatal area.

The Japanese team operated at two places, one on a mound, falling approximately 200 m south of Surajkund while the second on a small mound, north of the excavation camp marked as Area C and D respectively. The area C is an elevated mound spread over right from Khairatal towards west to the Dargah of Mira-Baba on the east, covering more than 200 m on either side. To know the settlement pattern, horizontal excavation was opted.

In Area C, the fortification was partially damaged and considerably eroded due to heavy flood. The actual spot of the mound Area C—raised to a height of 4 m approximately, from the ground level, was situated east of Khairatal and the rain water from Khairatal engulfed a considerable portion of the outer skirt of the mound, as a result, the findings mainly consisted of the eroded materials. The following trenches *viz.,* G 21, G22, G23, G24, H21, H22, H23 and H24 were taken up for digging. Out of these H22 was excavated down to a depth of 6-60 m yielding fifteen layers till the sub-soil water started oozing out from the bottommost layer (fig. 12).

Altogether three phases of structural activities (pl.XXI) were unearthed during the excavation, the latest phase was marked by a platform made of brickbats which was encountered just below the humus, at 10 cm depth, from the top. The second phase of structural activity was represented by two big house-complexes which were spread over in the eastern and western part of the excavated area. The third phase of the structural remains were confined only to the foundation level, which was occupied by the remains of the second phase.

The House-complex (No. 1) was situated in the southern half of the excavated area. The complex was roughly rectangular in plan (fig. 13). The bricks which were used in the foundation of these structures were of Kushan bricks size. The structures above the foundation however, appeared to be of the Gupta period.

This house-complex comprised ten rooms of different sizes and four courtyards. Room Nos. 1 to 4 were in the northern part of the complex in which Room No. 1 (2-38x1-93 m) was situated in the north-west corner while Room No. 4 was in the north-east corner. Room Nos. 5 (2-40x 1 -80m) and 6 (2-40x210 m) were in the middle of the eastern part of the house-complex. Room No. 7 (3-50x2-60m) was lying in the centre of the southern part of the complex and attached with the southern enclosure-wall. In the western part of this house-complex Room Nos. 8 and 9 were constructed. Room No. 10 was located almost in the centre of the complex.

The enclosure-wall towards western side was well preserved while the eastern, northern and southern enclosure-walls were damaged and missing at places.

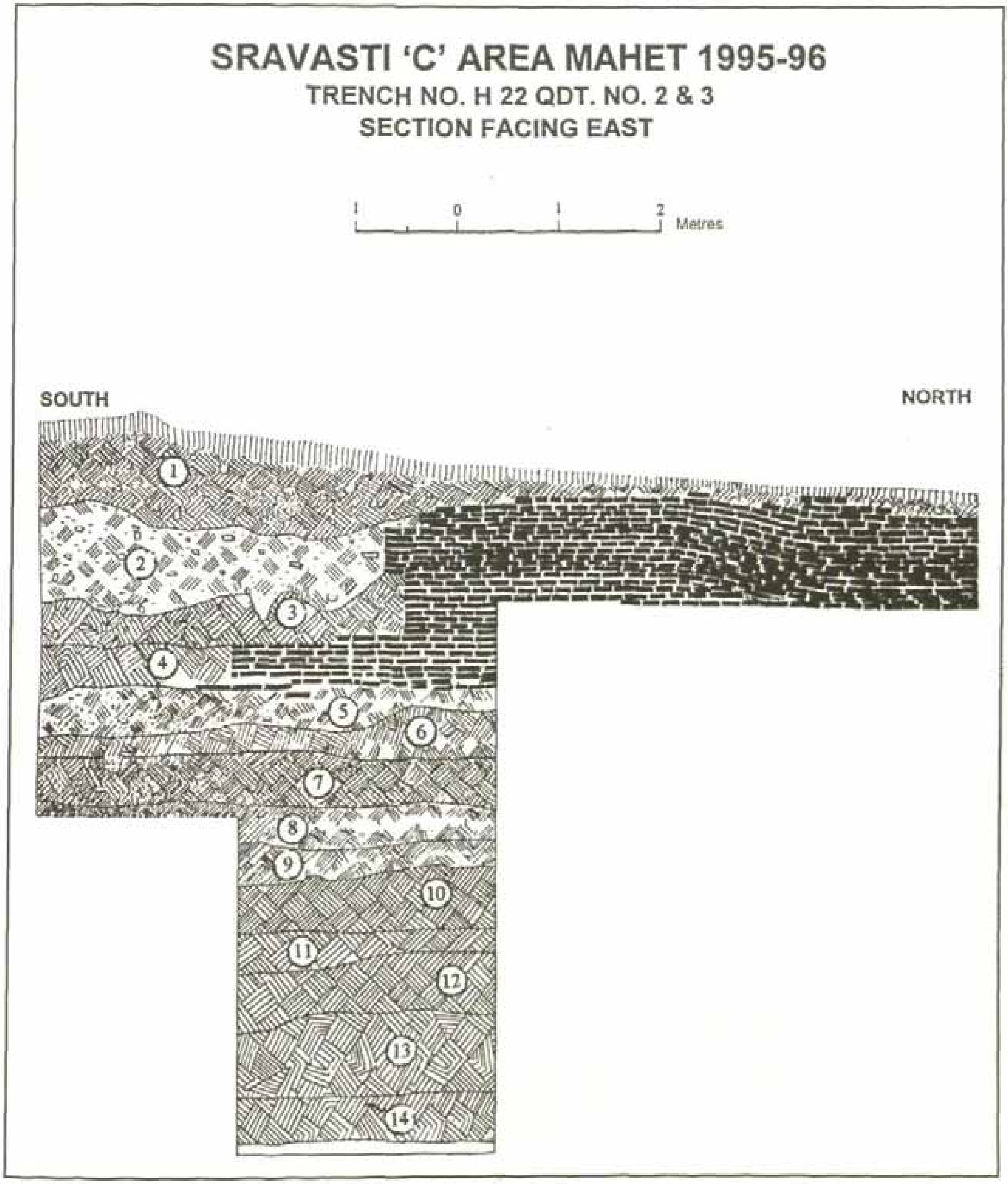

SRAVASTI 'C' AREA MAHET 1995-96
TRENCH NO. H 22 QDT. NO. 2 & 3
SECTION FACING EAST
1
0
1
2
Metres
SOUTH
NORTH
1
2
3
4
5
6
7
8
9
10
11
12
13
14

Fig. 12

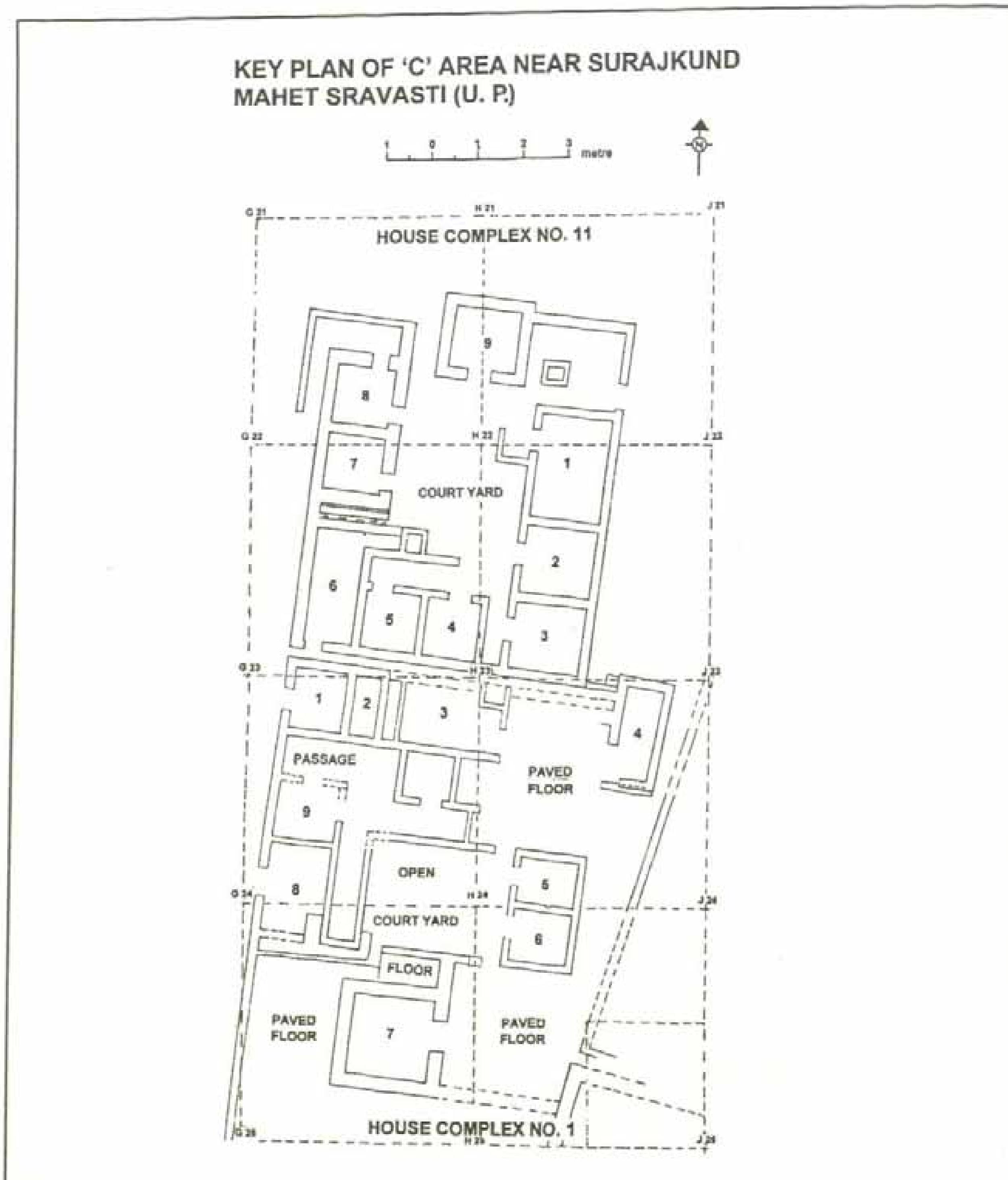

KEY PLAN OF 'C' AREA NEAR SURAJKUND
MAHET SRAVASTI (U. P.)
metre
HOUSE COMPLEX NO. 11
COURT YARD
PASSAGE
PAVED FLOOR
OPEN
COURT YARD
FLOOR
PAVED FLOOR
PAVED FLOOR
HOUSE COMPLEX NO. 1

Fig. 13

The courtyards, which were made of brickbats, also formed part of the house-complex. Courtyard A was in the north-east corner and the opening of Room Nos. 3 (4-40x2-40 m) and 4 (4-40x1-60 m) was made through this courtyard. Courtyard B was in the centre of the complex and to the west of Room Nos.5 and 6. The opening of Room Nos. 5 and 6 was made through this courtyard. The approach from Room Nos. 8 (3-59x2-50 m), 9 (2-57x2-57 m) and 10 (2-20x2-00 m) to this courtyard was through a corridor. Courtyard C was situated in the^outheastern corner, in front of the opening of Room No.7. Another brick-paved floor was also noticed in the southwestern corner of the complex.

Actually, Room No.2 (2-38x0-90 m) was an ante-chamber of Room No.l which was constructed with the help of a partition wall. Originally, Room Nos.5 and 6 were one room, divided into two rooms subsequently.

The remains of nitches were also noticed in the side wall of Room No. 10. Perhaps this room was used for the purpose of worship. In the northwestern corner of Courtyard A, a small square *hauz* was also constructed to collect and preserve the water. A drain was also constructed in the south-west corner of Courtyard B with bricks of varying size (32x21 x5cm and 32x22x5cm) and mud as the binding material.

The House-complex (No. 2), situated on the north of the House-complex No. 1, which was almost adjacent to it, separated possibly by a narrow passage of 46 cm. The exposed complex exhibited two phases of structures, as the house was almost a parallelogram on plan, though originally it might have been of rectangular shape. The north-east portion of the complex was badly disturbed with marks of repairs at later stages. The earliest phase of construction resembled the Kushan style while the latest phase that of the Gupta period, laid directly on the structural remains of Kushan period. The latest phase was constructed with the use of intact bricks and brickbats of earlier construction.

The complex was provided with an apron wall on the north-west corner. It was 70 cm away from the western wall of the house. The apron wall covers 4-46 m of the northern wall of the complex. The width of the wall was 35 cm with the remaining nineteen courses of intact bricks and a height of 1-58 m, marked by a single offset for providing necessary protection to the house-complex at the north-west corner.

The eastern enclosure-wall of the complex (15-84 m) was robbed on the northern side. This wall suffered a major damage due to failure of the foundation on the northern side. The western enclosure-wall (14-60 m), comprised fifteen courses of bricks. The width of the wall was 38 cm on the top and 60 cm at the base with one offset. The southern enclosure-wall (12-80 m) was with fourteen courses consisting of brickbats. The width of the wall was about 32-5 cm on the top and 48 cm at the base. The dimension of northern enclosure (14-40 m) was robbed on the eastern side.

The complex was provided with nine rooms, three passages and courtyard attached with a drain running east-west, originating from the courtyard. The Room Nos. 1 (4-55x2-65m) and 2 (2-03x2-65 m) were on the eastern side while Room No.3 (2-90x2-65 m) was in the south-east

comer of the complex. The Room Nos. 4 (2-40x2-35 m) and 5 (2-50x2-35 m) were on the southern side attached with southern enclosure-wall of the complex. Room No. 6 (500x2-12 m) was slightly large and situated on the south-west corner of the complex while Room Nos. 7 (2-65x2-55 m) and 8 (2-65x2-55 m) were towards the west of the complex. Room No. 9 (3-42x3-22 m) was a late addition to the complex, located in the middle towards the north.

The opening to^he rooms (1,2 and 3) was from the west, with the measurements varying from 1-17 m to 1-19 m. All these three rooms were inter-connected. There was a passage (2-70x0-86m) having a brick-paved floor in-between the western wall of Rooms 2 and 3 and eastern wall of Room 4. Adjoining the Rooms 4 and 5, was a passage (no. II) which measured 5-17x1-10m. While the passage (no. Ill) in front of rooms (7 and 8) was 8-50x 1 -20 m. Both these passages were of brickbats and mud.

The brick-paved courtyard, laid in two courses of bricks (32x22x5 cm) was situated almost in the centre of the house-complex, the dimension of which was approximately 9-60x3-40 m. Post-holes were also noticed in the courtyard. Besides, the adjoining passages, there was drain (1 3-20xw 018m) in the south-west corner of paved-courtyard, oriented east-west.

In Area E, located just north-east of the excavation camp, a 10x10 m trench was dug down to a depth of 2-85 m, with six layers in all.

The excavation revealed massive building activities, with three phases of constructional activities. But due to the limited area of operation, exact structural plan could not be ascertained. One complete room was however, exposed while another room was partly exposed.

The sizes of bricks found in phase I were 34x23-5x4-5 cm, 32x24x5 cm, 33-5x24x5 cm and 34x24x5-5 cm. The thickness of the wall of this phase was about 60 cm. The size of fully exposed room measured 3-25x2 m while the partly exposed room measured 2 m only. The sizes of bricks used in phase II were 33x25x6 cm, 33-5x24x6 cm, 34x24x6 cm. The size of room belonging to this phase was 3x 15 x2 -3 0 m and the thickness of wall was 90 cm. In phase III, the brick sizes were 24x17-5x6 cm, 24x18-5x6 cm, 23-5x18-5x6 cm and the room sizes were 3-25x2-52 m and 2-40x1-50m. In all the three phases of construction, there was use of mud-mortar as the binding material. The masonry was fashioned in English bond. A retaining-wall was also exposed in the northern side of this complex, meant probably for the protection of the main structure.

The ceramic industry was mainly represented by red ware, grey ware, black ware and NBPW both of developed and degenerated variety, besides a few sherds of PGW. The upper three layers were marked by red ware and black ware, though black ware was very limited in number. Other than the storage-jars and basin, the red ware pottery was wheel-turned, of well levigated clay in medium to fine fabric. The potsherds from the lower level were treated with bright and a thicker variety of red slip. From the upper layer was found mainly the potsherds of buff red ware. The common shapes were the bowls of different sizes often having corrugation on outer side and occasionally in the inner side with slightly incurved rim. Some of these have been treated with a wash of buff colour. Other shapes included shallow dishes, *lota* with sagger base and featureless

rim, *surahi,* spouted vessel, sprinkler, vases, *handi,* lids of different variety, miniature pots such as small dish, vase etc. Some of the sherds of this ware contained circular lines on the neck and the body portions with designs or cord marks, floral motifs and sun symbol as decorative designs.

The intermediate layers yielded potsherds of red ware, grey ware, degenerated NBPW and black ware. The shapes in red ware comprised small bowls with thin section and incurved rim, dishes of different variety, hand-made and ill-fired storage-jar, vases, miniature pots, spouted vessel etc. Few potsherds of red ware were also treated with red slip and contained circular lines on the neck portion, besides the incised knotches on the neck portion of the miniature pots. The shapes in other wares comprised the bowls and dishes.

From the lower levels were collected the sherds of red ware, the NBPW, black ware, grey ware and PGW. The important shapes comprised small and big bowls, dishes, lids, vases, basin and miniature pots. The NBPW was predominantly represented by bowls and dishes. The bowls were with featureless rim and vertical sides; although at times these comprised corrugated sides and slightly incurved rim. Different shades of NBPW were noticed with a variety of colours and hue, i.e., golden, silver, silver and black, golden and black, black, grey and black, blue and black, chocolate and violet.

Grey ware of both thicker and thinner variety, made of well-levigated clay in fine fabric, found in excavation, comprised mainly the shallow bowl and dish. A few sherds of grey ware also contained painting in blue black and black colour. In the course of excavation, PGW sherds were also noticed along with NBPW. The sherds of this ware were too fragmentary to ascertain the exact shape. The horizontal bands in white and black also occurred on the grey surface. The potsherds were of thin section and fine fabric. The sherds of PGW were found from layer 6 to layer 8 only along with the matured sherds of NBPW. Other noteworthy pottery recovered from the excavation comprised interior chocolate and exterior black; interior cream and exterior red; interior grey and exterior black; interior black and exterior grey; interior black and exterior red.

The lowest layer in the above area yielded potsherds of red ware, black ware, grey ware and NBPW with the notable absence of PGW.

A wide range of antiquities in terracotta, bone, copper, iron, semi-precious stone, etc., were recovered. These included terracotta human and animal figurines, beads, disc, hopscotch, toy cart-wheel, balls, gamesmen, seal, sealings, etc. The human figurines mostly comprised fragmentary human heads and a few terracotta plaques. The animal figurines comprised mostly the elephant, at times with decoration, in addition to horse, dog, bull along with a few birds. Although the terracotta beads were limited in number, represented mostly by the *ghata,* arecanut and discoid shapes. Terracotta discs are decorated with nail impressions around the circumference from both the sides. Some of these were carved with incised designs in a radiating fashion or with the sun symbol. The iron objects comprised razor, arrow-heads, nails, knives, blade, etc. The copper objects contained coins, antimony rod, bangle, etc., while the bone objects included only arrow-heads. Among other finds, mention may be made of beads of semi-precious stone, mainly banded agate and carnelian etc., besides glass beads, glass bangles of different colours, stone pestles and querns of sandstone, etc.

The site (Area C), on the basis of finds, could be assignable to a period from the seventh century BC to fourth century AD with three broad divisions *viz.,* seventh century to third century BC; third century BC to the early Christian era and lastly, from the early Christian era to the fourth century.

In Area E the digging was restricted to the level datable from the early Christian era to the fourth century only as the lower level remained unexposed.

57. EXCAVATION AT BHUNADIH, DISTRICT BALLIA.— The Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, under the direction and co-direction of P. Singh and Ashok Kumar Singh respectively, assisted by R. N. Singh, Santosh Kumar and A. K. Pandey, conducted a small-scale excavation at Bhunadih (25°59'10";84°5'10").

The site, located 2 km east of Janwan on the right bank of Bahera Nala, a tributary of Chhoti Saraju Janwan, is situated 28 km north from Ballia town on Ballia-Sikanderpur road. The mound extends in an area of about 4 acres and the extant height gradually rises to well over a metre. On the eastern part of the mound there is a primary school while the western portion is being used as a cemetery by the local Muslim community. Although the human activities have greatly disturbed the stratigraphic position of the site, the excavation revealed a two-fold cultural sequence *viz.,* Period IA - pre-Narhan culture; Period IB - overlap phase (between pre-Narhan and Narhan cultures); and Period II - Narhan culture.

Excavation in eight test pits (2mx2m) in Period I A, towards the western part of the mound, revealed pre-Narhan pottery, represented by cord-impressed red ware, plain red ware with spouted-vessels and vases. The straight-sided beakers of red ware with short spout *(martban)* was a new find at this site. Other important shapes comprised vessels of red ware with closed mouth, basins of red ware with flared rim and grooves on the exterior.

The inhabitants of Period IA lived in wattle-and-daub houses, represented by burnt clay lumps with reed marks. The small finds from Period IA comprised a few micro-beads of steatite, terracotta and pottery discs.

Period IB represented the overlap phase between pre-Narhan and Narhan cultures and the structural activity during this sub-phase essentially remained the same as in Period IA. The ceramic assemblage of this sub-period consisted of cord-impressed and plain black-and-red; black-slipped and red wares. The principal shapes and characteristic features were pedestalled-bowl and dish-on-stand in black-and-red ware, /o/o-shaped vessels in black-slipped were, a few sherds bearing post-firing scratching on the exterior (usually comprising geometric pattern) and a few painted sherds of red ware with dots and dashes. The small finds comprised pottery discs, beads of steatite, semi-precious stones and terracotta.

Period II is marked by the material remains of Narhan culture, documented at the type-site. The inhabitants of this period lived in wattle-and-daub houses, as evidenced by a large number of reed marks. The small objects comprised beads of steatite, semi-precious stones, terracotta and pottery discs.

The archaeobotanical remains and animal bones of these two periods were collected, the detailed study of which would supplement the data regarding the flora and economy of the earliest inhabitants.

58. EXCAVATION AT SISWANIA, DISTRICT BASTI.— Excavation Branch-II, New Delhi of the Survey, under the direction of B.R. Mani, assisted by K.K. Sharma, Vishnu Kant, L. S. Mamani, V. P. Verma, Vinod Kumar, Chandra Bhan and Charan Singh, conducted excavations at Siswania (26° 45' N; 82° 46' E) on the left bank of River Kuwano or Kuwana, a tributary of Sarayu. The site was discovered in 1944 and a large number of coins, terracotta figurines, beads, sealings and other objects were collected from time-to-time. On the basis of reference in Pali Buddhist literature, the site has been identified with Setavya, the ancient city of Kosala.

The entire site was divided into three areas SWN-1, S WN-2 and S WN-3 as per the existence of three mounds separated by water-channels along the River Kuwano in north-south orientation. After exploration and contour-survey, trenches of 1 Ox 10m were laid and excavations were taken up in 21 quadrants of 15 squares during the first season's work. Mounds at SWN-2 and SWN-3 were found badly damaged due to extensive cultivation and levelling of the area. The main mound at SWN-1 was found in a better state of preservation although the top layers have suffered some damage due to the levelling of ground for cultivation and some activities in the late medieval period.

The deposits at the site (fig. 14) indicated tentatively a sequence of four periods — Period I: pre-NBPW period *(circa* ninth-sixth century BC); Period II : NBPW period *(circa* sixth to third century BC); Period III : Sunga period *(circa* second century BC to the first century BC); and Period IV : Kushan period *(circa* first century to third century AD).

The pre-NBPW deposits were characterized by the presence of black-slipped ware, a couple of these being white painted, black-and-red ware (plain) and associated red ware. In some quadrants, NBPW was also present in the earliest level suggesting a small duration of pre-NBPW occupation at the site. It is also significant to note that the pre-NBPW deposits were limited to certain areas in particular, while the NBPW period was comparatively rich at the site with a wide range of ceramics including black-slipped ware, grey ware, a few sherds of black-and-red ware and associated red ware. Among the notable finds of Period II mention may be made of bone points, arrow-heads, stone beads, terracotta figurines, iron and copper objects, a bull-shaped pendant with gold foil, etc. There were evidence of hearths noticed on the working levels of the habitational deposits of this period in Square ZE-5.

The Sunga period was characterized by red ware and black-slipped ware besides a large number of copper coins of cast uninscribed variety and Ayodhya coins in addition to terracotta plaques and other associated antiquities. A cattle burial (pl.XXIIA) was also found in this period.

The Kushan period deposits were the latest deposits at the site which have suffered much damage during the recent years. Burnt-brick structures and floors (pl.XXIIB) have been noticed but no proper house plan was encountered. Tiles were also found from the deposits. Red ware

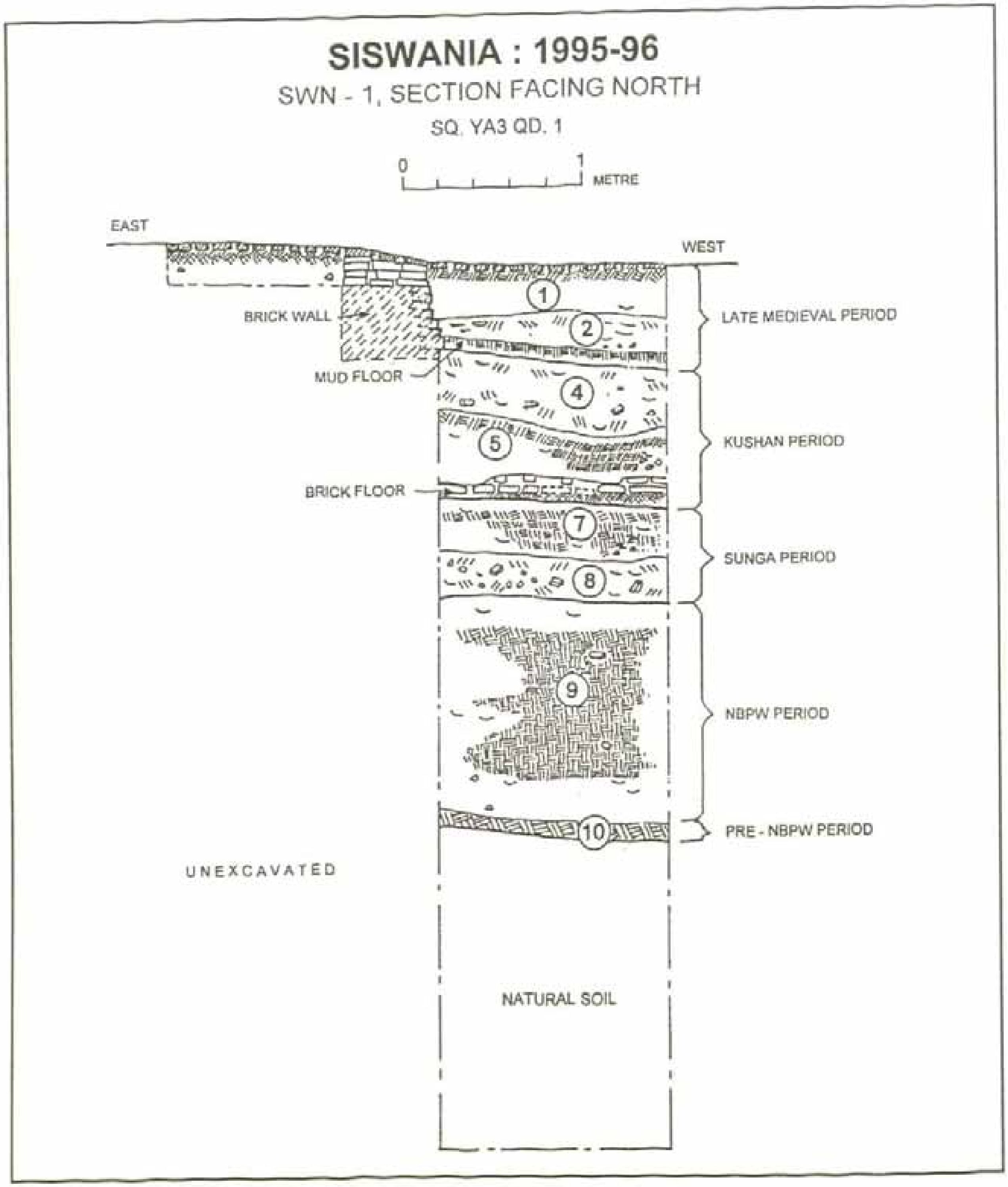

SISWANIA : 1995-96
SWN - 1, SECTION FACING NORTH
SQ. YA3 QD. 1
0
1
METRE
EAST
WEST
BRICK WALL
MUD FLOOR
BRICK FLOOR
1
2
4
5
7
8
9
10
LATE MEDIEVAL PERIOD
KUSHAN PERIOD
SUNGA PERIOD
NBPW PERIOD
PRE - NBPW PERIOD
UNEXCAVATED
NATURAL SOIL

Fig. 14

including fine red-slipped ware was the main ceramic industry of the period and the typical Kushan shapes like sprinklers, ink-pot lids and thumb-impressed incurved bowls have been found. Terracotta pestles have also been found in a large number besides terracotta human and animal figurines of Kushan tradition.

Silver and copper punch-marked and Kushan coins were also found in the excavation as well as collected from surface.

It was noticed that the shapes in pottery belonging to pre-NBPW and NBPW deposits were quite common. There could be noticed a similarity atleast upto the early deposits of NBPW period indicating that the people using black-slipped ware and black-and-red ware settled first at the site and their ceramic tradition continued with the introduction of NBPW. This perhaps could be the reason for either its limited occurrence or the total absence of NBPW sherds in the lowest deposits above the natural soil while the early shapes were predominant in black-slipped ware, fine red ware and plain black-and-red ware. In the second period however, these continued along with the sherds of NBPW and grey ware. Black-and-red ware sherds of vase, dish and deep bowls have been found which were well-fired and in medium fabric. Coarse black-and-red ware sherds have also been found. The black-slipped ware included mainly convex-sided dishes and bowls, besides deep bowls and in slightly inturned rim or having mild depression on the exterior part of the rim. They were well fired and in medium to coarse fabric. Red ware of both hand-made and wheel-turned varieties were the predominant ceramic types represented by jars with externally flared rim having cord impressions on the exterior part of the body, deep bowls with sharp inturned rim, bowls of medium size with incurved rim, channelled-bowls, perforated-bowls and footed-bowls, vases, convex-sided dishes, miniature lids or stoppers, basins including channelled or lipped-basins, miniature pots, black painted red ware, hopscotches etc. Vases of Ahichchhatra XA type were present in the second period. NBPW of both monochrome as well as polychrome varieties having silver, golden, black, red and greyish shades have been found comprising mainly the convex-sided dishes and bowls with sharp rim, sometimes having mild depression on the exterior part, ranging from medium to fine fabric, occasionally painted. Grey ware sherds of convex-sided incurved dishes and well-fired convex-sided bowls of medium fabric were found from the levels of second period.

More than seven hundred antiquities were recovered from the excavation besides surface finds, including the terracotta plaques showing *mithuna* figures, *yakshis* and gaja-Lakshmi of Sunga period (pl.XXIIIA-B and C); Kushan terracotta heads (pl.XXIVA) and *Naigamesa* and *Naigamesi* figurines (pl.XXIIID); terracotta animal figurines (pl.XXIVB); copper objects such as, antimony rods, needles, rings, hair-pins, bracelets etc.; semi-precious stone beads, chlorite stone weight, glass bangles and beads, iron implements in the form of nails, rods, rings, arrow-heads etc., bone points and arrow-heads with tang or hole at the bottom; copper coins of uninscribed cast variety and of rulers of Ayodhya, besides punch-marked coins and Kushan coins from surface collection; terracotta pestles (pl.XXVA), ear-studs, toy-carts (pl.XXIVD), wheels, wheel-cum-pendants (pl.XXIVC), gamesman, balls, double perforated wheel, dabber, skin rubber, bangles, beads, weight, stopper, stamps, disc and miscellaneous objects in terracotta including two prizmatic ones from NBPW level (pl.XXVB); decorated bone and ivory objects, stone grinders, crucibles, a gold plated

bull-shaped pendant and iron object with a tiny gold piece attached with it; five clay sealings mostly with the legend *'Idadevasa' (Indradevasya)* in Brahmi script of *circa* second-first century BC.

Excavation was also carried out in one quadrant at the mound at Deoraon about 2 km north-west of Siswania, located along the same bank of the river. The cultural sequence and material noticed here are similar to those found at Siswania. A wall of broken brickbats belonging to the late Kushan period was also exposed. The name Deoraon suggests it to be a monastic site outside the city of Setavya which might have been called Devarama. *Simsapa-vana* at Setavya has been mentioned in Pali texts which could probably be identified with Siswania or the jungle of *Sisam (Simsapa)* trees, i.e., *Dalbergia Sisu.*

59. EXPLORATION IN DISTRICTS BASTI AND SIDDHARTHNAGAR.— Excavation Branch-II, New Delhi of the Survey, under the direction of B. R. Mani, assisted by K. K. Sharma, Vishnu Kant, L. S. Mamani, V. P. Verma, Vinod Kumar and Charan Singh, explored forty-five sites in river valleys of Burhi Rapti, Kuwano or Kuwana, Manwar and Ami—all tributaries of Sarayu or Ghaghra in order to confirm the cultural assemblage of some of the earlier reported sites. During the exploratory survey in trans-Ghaghra plains, the team discovered ancient and medieval sites at Benipur, Painra, Nagar, Amorha Fort, Chhavani, Jata, Ama, Kopa, Ukada, Mahjidia I and III, Chando, Shahpur, Itawa, Sarpoka-Pipari group, Buddhi Khas, Jiganadham and Kotia. The cultural assemblage of these sites besides other reported ones, ranged from NBPW to Sunga-Kushan period. The extensive mounds at Nagar, Ama, Ukada and Sevaidih (Saltauwa) could be identified with ancient settlements mentioned in Pali Buddhist literature as Nagaraka Nigama, Atuma, Ukkattha and Salavatika. An exploratory survey at Dharamsinghwa revealed evidence of Kushan structures. Remains of stupas were discovered at Mahjidia I and Sevaidih. A beautiful 86 cm high stone sculpture of a headless *yakshi* datable to Maurya-Sunga period was discovered at Buddhi Khas (pl.XXVIB)besides sculptures of Vishnu, Buddha, Siva, Narasimha, etc., datable to Gupta and post-Gupta periods. In a late medieval temple at Jignadham a sculpture of Vishnu (pl.XXVIA) in black stone in typical Pala style of ninth-tenth century AD was noticed.

60. EXPLORATION ALONG THE ALAKNANDA VALLEY, DISTRICT CHAMOLI.—The Regional Archaeological Unit, Pauri, of the Department of Archaeology and Museums, Government of Uttar Pradesh, under Rakesh Tewari, assisted by B. P. Badoni and R. S. Kailkhuri, conducted exploration along the Alaknanda valley between Rudraprayag and Karnaprayag and brought to light the following archaeological sites.

Tehsil	*Village*	*Nature of remains*
Chamoli	Dungar	A late medieval Valabhi style temple
-do-	Mahad	Group of Nagara style medieval temples with sculptures of Vishnu, Uma-Mahesa, *seshasayi*-Vishnu and nritya-Ganesa

Tehsil	*Village*	*Nature of remains*
Chamoli	Salna	Sculptures of gaja-Lakshmi, Mahishamardini Durga and Vishnu of medieval period.
Karnaprayag	Bamoth	Remains of medieval times; sculptures of Vishnu, Mahishamardini and Ganesa
-do-	Bhatnagar	Medieval sculpture
-do-	Deval	Nagara style medieval temple ; sculptures of Mahishamardini Durga and Vishnu
-do-	Gwar	Remains of medieval temple
-do-	Jhalimath	Group of medieval temples, sculptures of gaja-Lakshmi, Vishnu, Uma-Mahesa and Kubera etc., late medieval Valabhi style temple
-do-	Panai	Medieval temple with sculptures of Vishnu, Surya, Uma-Mahesa, Kubera, etc.
-do-	Ranaun	Sculpture of Mahishamardini Durga, medieval period
Rudraprayag	Chopra	Remains of medieval period; sculptures of Vishnu, Parvati and Uma-Mahesa
-do-	Gadmil	Remains of medieval temple
-do-	Kamera	Sculptures of Vishnu, medieval period and Lakshmi-Narayana, late medieval period
-do-	Koteshwar	Late medieval sculpture of Ganesa
-do-	Kurjhan	Late medieval *naula*
-do-	Ratura	Medieval temple and fragmentary sculptures of Surya and Parvati
-do-	Shivanandi	A late medieval temple of Narayana
-do-	UmaraNarayan	Group of temples, sculptures of Ganesa and Lakshmi-Narayana, medieval

61. EXPLORATION IN DISTRICT DEORIA.— In the course of village-to-village exploration in Rudrapur tehsil, Raj Kumar of the Regional Archaeological Unit, Gorakhpur, under the general guidance of Rakesh Tewari of the Department of Archaeology and Museums, Government of Uttar Pradesh, noticed the following sites of archaeological importance.

Site	*Nature of remains*
Adrangi	Medieval sculptures
Amauni	Medieval
Bhadila	Post-Gupta and early medieval remains
Buraon	Red ware
Kapurwara	Grey ware, black-slipped ware and red ware
Khudia	Medieval red ware
Kushwa	Medieval red ware
Madanpur	Red ware
Mahadaha	Medieval red ware
Mahan	Medieval sculptures
Nai kot	Medieval red ware
Sahankot	Medieval sculptures, red ware and mud-fort

62. EXPLORATION IN DISTRICT ETAH.— G. N. Srivastava of the Agra Circle of the Survey, during the course of exploration, noticed the architectural remains of a temple along with structural remains of a series of cells at village Kasaulia (27°31' N, 79° 1' E), located in P. S. Jaithra of the Aliganj tehsil of the district. The building material used in these constructions consisted of lime-conglomerate slabs. The blocks of lime-conglomerate *(kankar-slab)* were dressed beautifully in desirable shapes and sizes. The base mouldings of the temple had been designed in the traditional architectural pattern. A fragment of nicely carved *chaitya-gavaksha (sukanasa),* could be datable to *circa* eight-ninth century AD on the basis of stylistic considerations. Some brick alignments have also been noticed in this place. The site, traditionally called as *devasthana* and also listed in the revenue records by the same name, has been badly encroached upon by village constructions like cattle-pens and other domestic uses. Adjoining the site there existed an extensive mound, which at present, has been levelled and under cultivation.

The remains of another temple of the same period has been noticed at village Pinjari (20° 27' N; 79° 2' E), located about 10 km southwards from P. S. Jaithra in the Aliganj tehsil. Here the ruins of a collapsed temple built in lime-conglomerate *(kankar-slab)* were found lying under the

cover of dense bushes and creepers. The ruins survived upto the plinth level suggested that on plan the temple had a sanctum chamber and a *mandapa.* The detached and fallen architectural members datable to *circa* eighth-ninth century AD, namely the huge *amalaka* and the *bhumi amalas* indicated that this was built in *nagara sikhara* style.

63. EXCAVATION AT SANKISA, DISTRICT FARRUKHABAD.— Excavation Branch-II, New Delhi, of the Survey, under the direction of B. R. Mani, assisted by K. K. Sharma, Vishnu Kant, L. S. Mamani, V. P. Verma, Vinod Kumar and Charan Singh, carried out excavations at Sankisa (27° 20' N; 79° 20' E) identified with Sankasya. It is referred to as the royal city and the capital of Kusadhvaja, the brother of king Janaka in Valmiki's *Ramayana* and with Sankassa mentioned in Pali Buddhist texts as the place where Buddha accompanied with Brahma and Indra descended from the *trayastrimsa* heaven after preaching the *dhamma* to his mother Mayadevi.

The mounds at Sankisa are scattered in almost a circular area with a periphery of about 6 km. The present village of Sankisa is located on a high mound measuring nearly 400 m east-west and 300 m north-south direction, with a height of over 12 m. Nearly 300 m due south is another mound of solid brick-work, supposed to be a stupa, topped by a late medieval temple of Bisharidevi. An Asokan elephant capital has been lying at the site under a shed. The entire area within the earthen rampart is full of mounds of different size and heights. A few mounds, outside the ramparts, are still in existence. During the course of earlier explorations, PGW, NBPW and its associated red ware and terracottas, coins, sculptures and other antiquities have been found from these mounds of this ancient site, but their stratigraphic context was studied for the first time during present excavation.

In order to know the antiquity of the site and its cultural sequence, three quadrants of two 10x10 m squares were excavated towards south of the mound where the Bisharidevi Temple is situated. The sherds of PGW were found only in that area during explorations of the site, hence excavations were taken up in Qds 3 and 4 of Sq A 1. Towards south-east of the mound, on a separate smaller mound, Qd 3 of Sq E 10 was also opened.

In Square A 1, the top three layers have a number of early and recent pits and as a result the material was very much mixed up. The habitational deposits of Sunga-Kushan period at this spot have suffered much disturbance and early material including sherds of PGW, NBPW and black-slipped ware have been found mixed up with the material of Sunga-Kushan period. Similarly at E 10, the top two layers appeared to be filling and levelling deposits.

At A I, a mud-floor having the thickness of 8 cm, with remains of circular post-holes was found in Qd 4, sealed by layer 3. The deposits below the level of the floor were quite reliable and two firm and thick layers of the deposits of PGW level were found in layers 5 and 6 with a thickness of about 1 -25 m (fig. 15). It could therefore, be presumed that the mud-floor with post-holes might belong to the early NBPW period. Total deposit in both the quadrants over the natural soil was found to be more than 2-5 m. In Qd 3 of E 10, the layers 3 and 4 have yielded material belonging to the Kushan period. The thickness of this deposit was about 40 cm. A burnt-brick wall, 2-10 m long, having two extant courses of bricks, was found which might belong to the Kushan period. The wall

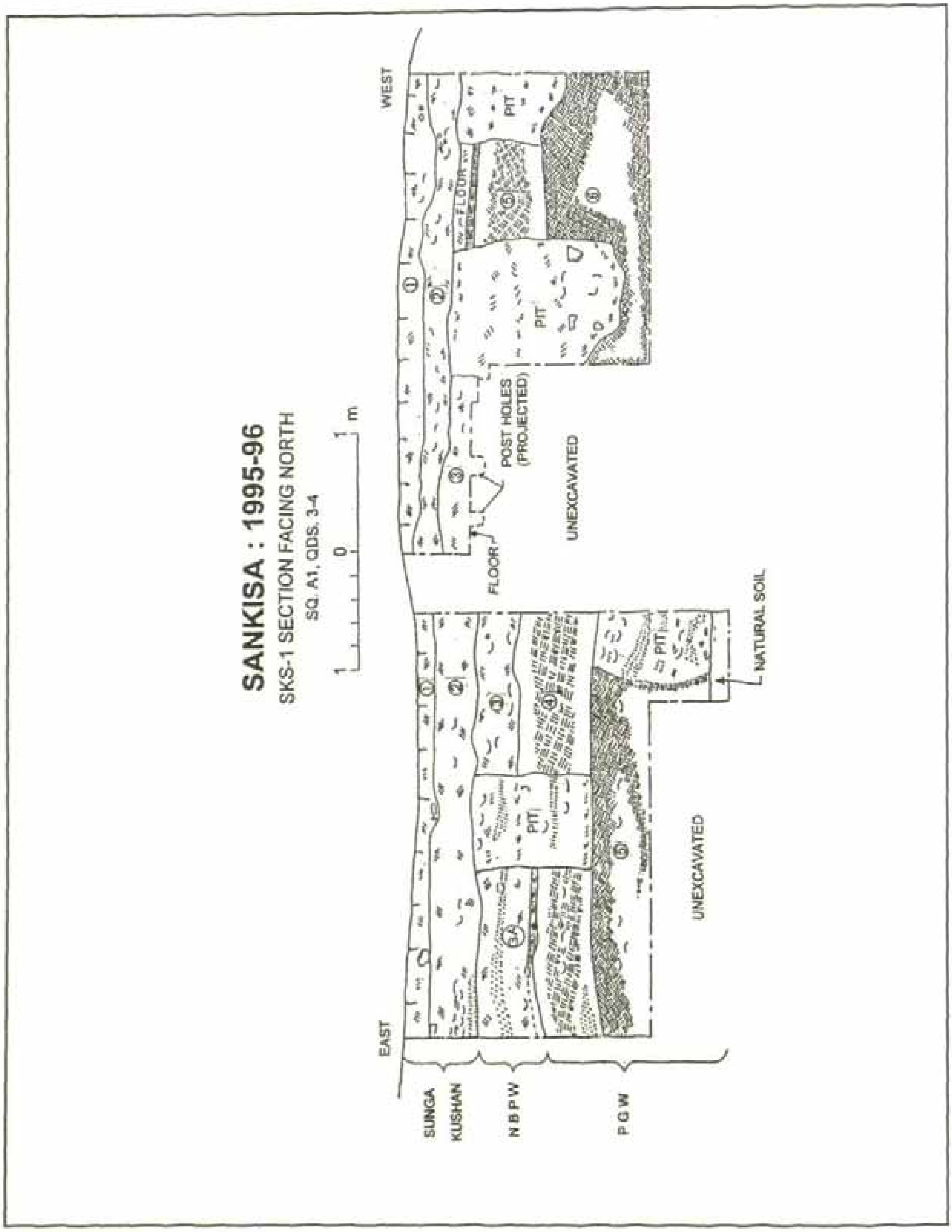

SANKISA : 1995-96
SKS-1 SECTION FACING NORTH
SQ. A1, QDS. 3-4
1
0
1 m
WEST
EAST
FLOOR
PIT
POST HOLES (PROJECTED)
UNEXCAVATED
NATURAL SOIL
SUNGA KUSHAN
N B P W
P G W

Fig. 15

in east-west direction with a width of 0-75 m, was found extending further towards both the sections. Maximum size of the bricks used in its construction was 44x27x6-5 cm. Layer 5 (lm thick) of this quadrant has yielded material datable to the first two centuries before Christ. Layers 6 and 7 with a thickness of about 1-05 m have yielded NBPW with its associated red ware. Total deposit over the natural soil in this quadrant was about 4 m.

In all the above trenches natural soil was touched below the habitational deposits mentioned above.

The most important investigation in the first season's excavation work at the site was the confirmation of PGW deposit which yielded besides usual shapes of PGW, black-and-red ware, black-slipped ware and associated red ware; important antiquities like terracotta bust of mother goddess, a similar terracotta female figurine (pl.XXVIC), terracotta rattle, discs and other miscellaneous objects (pl.XXVID), bone points and arrow-heads, iron chisels and a stone bead which reflect the material culture of early Iron Age (Period I). PGW sherds have been found from top levels in Sq A 1 till the pick-axe touched natural soil. Its frequency was found more in layers 3, 3 A and 4 in Qd 3 and layer 3 in Qd 4.

Surface finds from different areas of Sankisa, the village mound and the area towards its north in particular, indicated that the cultural deposits of other periods would surely reveal more detailed results. On the basis of finds, the cultural assemblage noticed at the excavated site could be divisible into four periods *viz.,*

Period I	Painted Grey Ware period (c. ninth century BC to *c.* sixth century BC)
Period II	Northern Black Polished Ware period (c. sixth century BC to *c.* third century BC)
Period III	Sunga period (c. second century BC to *c.* first century BC)
Period IV	Kushan period (*c.* first century AD to c. third century AD)

This classification was tentative and as per generally accepted divisions. This could be confirmed only after further excavations are done at the site and also by studying the antiquarian remains besides scientific dating of the samples collected during excavation.

Layers 3 and 4 in Qd 3 of Square E 10 which represented the Kushan deposits, yielded tiles and a very few early shapes of sharp-edged and incurved bowls in red ware besides a few black-slipped ware sherds. The main ceramic industry was red ware of both plain and slipped variety. Hand-made storage-jars and wheel-turned sherds comprising spout of sprinkler, lipped-basin, medium-size basins having nail-headed variety also, bowls including sharp-edged bowls and thumb-impressed incurved bowls with string-cut bases, small to medium-size vases, spout, lamps and

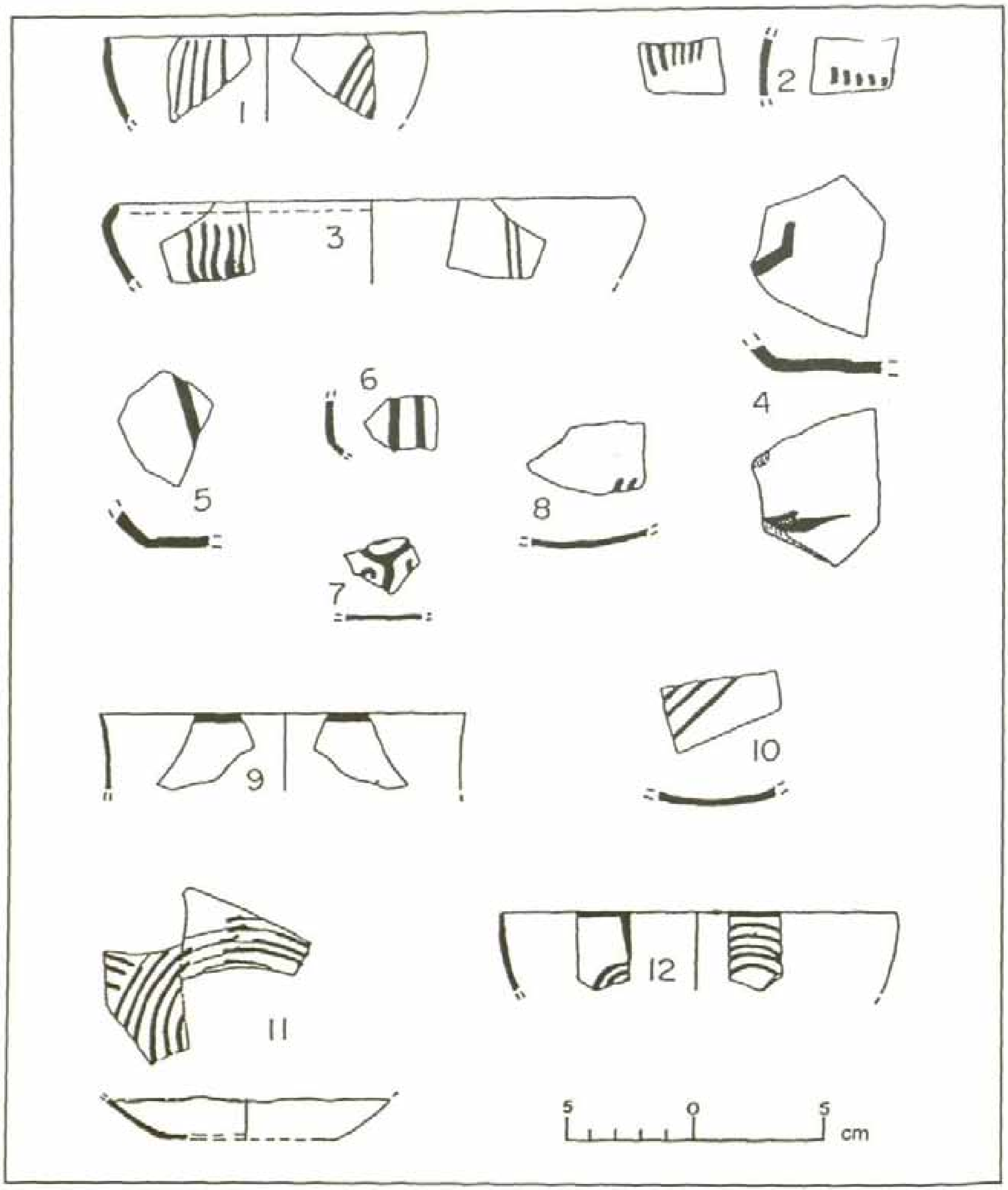


Fig. 16. *Sankisa : Painted Grey Ware shapes*

decorated pottery with incised multi-grooved designs and stamped decorations of *srivatsa* and leaf designs have been found from layer 3. Shapes from layer 4 comprised thumb-impressed incurved bowls, deep bowl with slightly out-turned rim, small to medium-size vases, lids, handle, lipped-basins, short-necked vase with out-turned rim having multi-grooved decoration on the exterior part of neck, medium-size vase with applique shoulder design and hand-made storage-jars. Tiles have also been recovered.

Layer 5 of Qd 3 of Square E 10 marked the Sunga period, represented by red ware sherds, comprising base parts of bowls, spouted-bowl with incised design, bowl with flat rim which might have also been used as cover or lid, miniature bowl with perforation at the side of the base part, small vases with short neck and out-turned rim, medium-size vases with multi-grooved design, vases of Ahichchhatra XA type, miniature pots, handle of jar, water vessels, carinated *handi,* knobbed-lid, convex-sided dish, medium-size jar having flat top for provision of lid or cover, sprinkler, lids, deep bowl, bottle-necked flask or water vessel, dish having externally flared rim and hand-made storage-jars. Hopscotches of grey ware and red ware and tiles have also been recovered.

Layers 6 and 7 of Qd 3 of Square E 10 represented the NBPW period. The finds comprised the sherds of deep bowls and convex-sided dishes in grey ware, associated red ware shapes including the bases of bowls, deep bowl, funnel-shaped lid, miniature pots, convex-sided dishes, carinated *handi,* nail-headed basin with soot marks on both the surfaces, channelled-basin (dia 36 cm), plain basin, small to medium-size vases, vase of Ahichchhatra XA type, small incurved bowl and hand-made storage-jars, besides a tile with hole. NBPW sherds were found from pit-I sealed by layer 6 which comprised mostly dishes with black, golden and silver shades having medium to fine fabric. A convex-sided dish with golden shade has the diameter of 26 cm. Red ware sherds from the same pit comprised hand-made plain and cord-impressed storage-jars with externally flared rim having husk impressions or storage-jars with applique bands on the junction of rim and body, large bowl with incurved rim and tapering side (dia 36 cm), convex-sided dish, deep bowl, small to medium-size vases including Ahichchhatra XA type, small incurved bowls, carinated *handi* and bottle-necked vase. Deep bowl of black-slipped ware and convex-sided dish of grey ware were also found in the pit besides hopscotches.

From the layer 7 of Qd 3 of E 10, convex-sided dishes in grey ware and black-slipped ware have been recovered. The shapes in associated red ware consisted of incurved bowls, string-cut bases of bowls, deep bowls, convex-sided dishes, basins, ledged and carinated *handis,* medium to large-size vases including Ahichchhatra XA type, miniature pot with soot marks, mat-impressed and corded sherds of jars, one with applique band on shoulder and painted and incised decorations on sherds. A hopscotch was also found.

Layers 3, 3A, 4 and 5 of Qd 3 of Square Al have yielded a good number of PGW sherds (fig. 16), besides its associated ceramics (figs. 17-18). Layers 5 and 6 of Qd 4 of Al were less disturbed which provided definite evidence of habitational deposit of pre-NBPW period. A large unbaked storage-jar was noticed in the section facing west in this deposit, sealed by layer 5. The red ware of both hand-made as well as wheel-turned variety having coarse to fine fabric have been

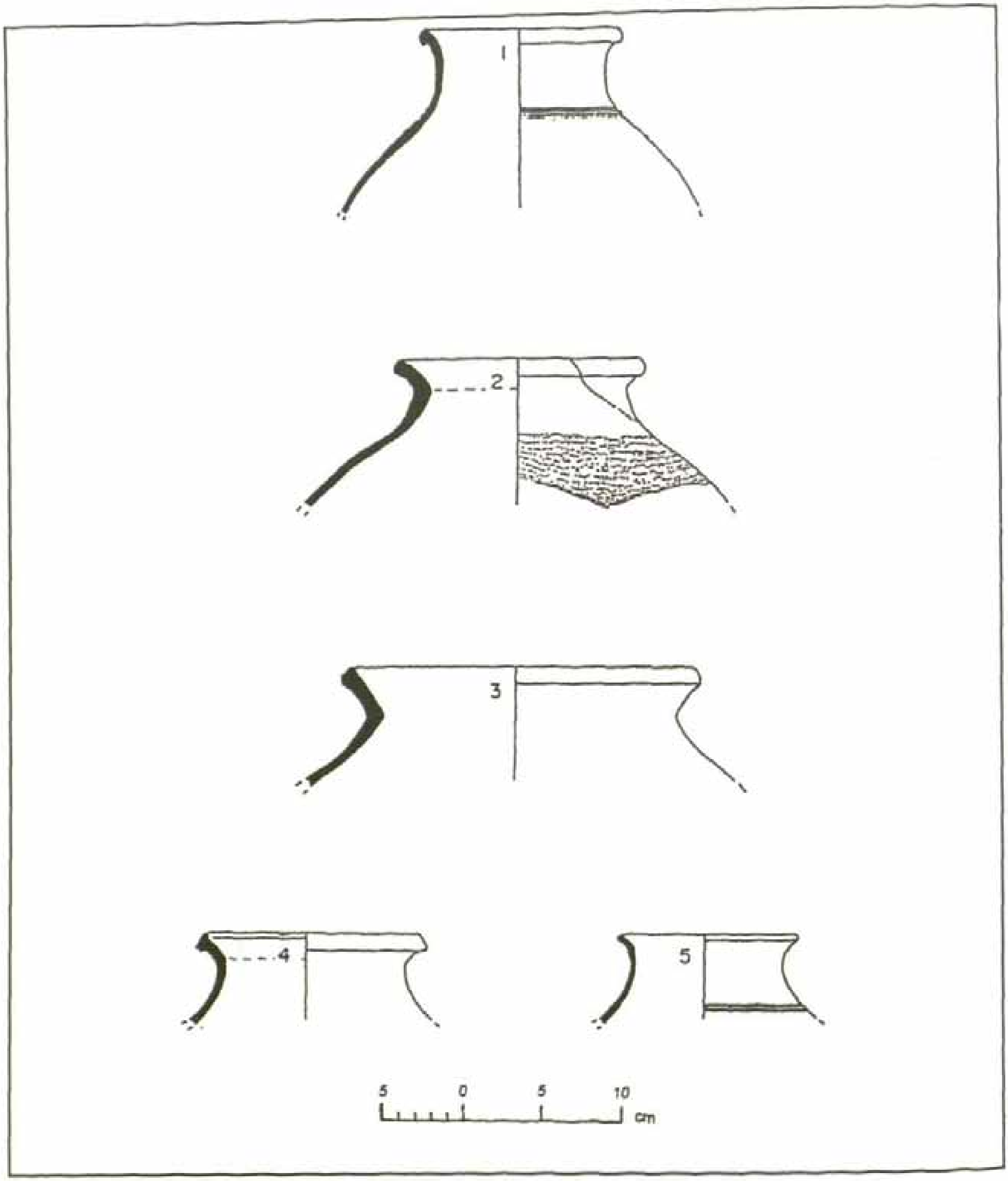


Fig. 17. *Sankisa : Red ware vases, PGW level*

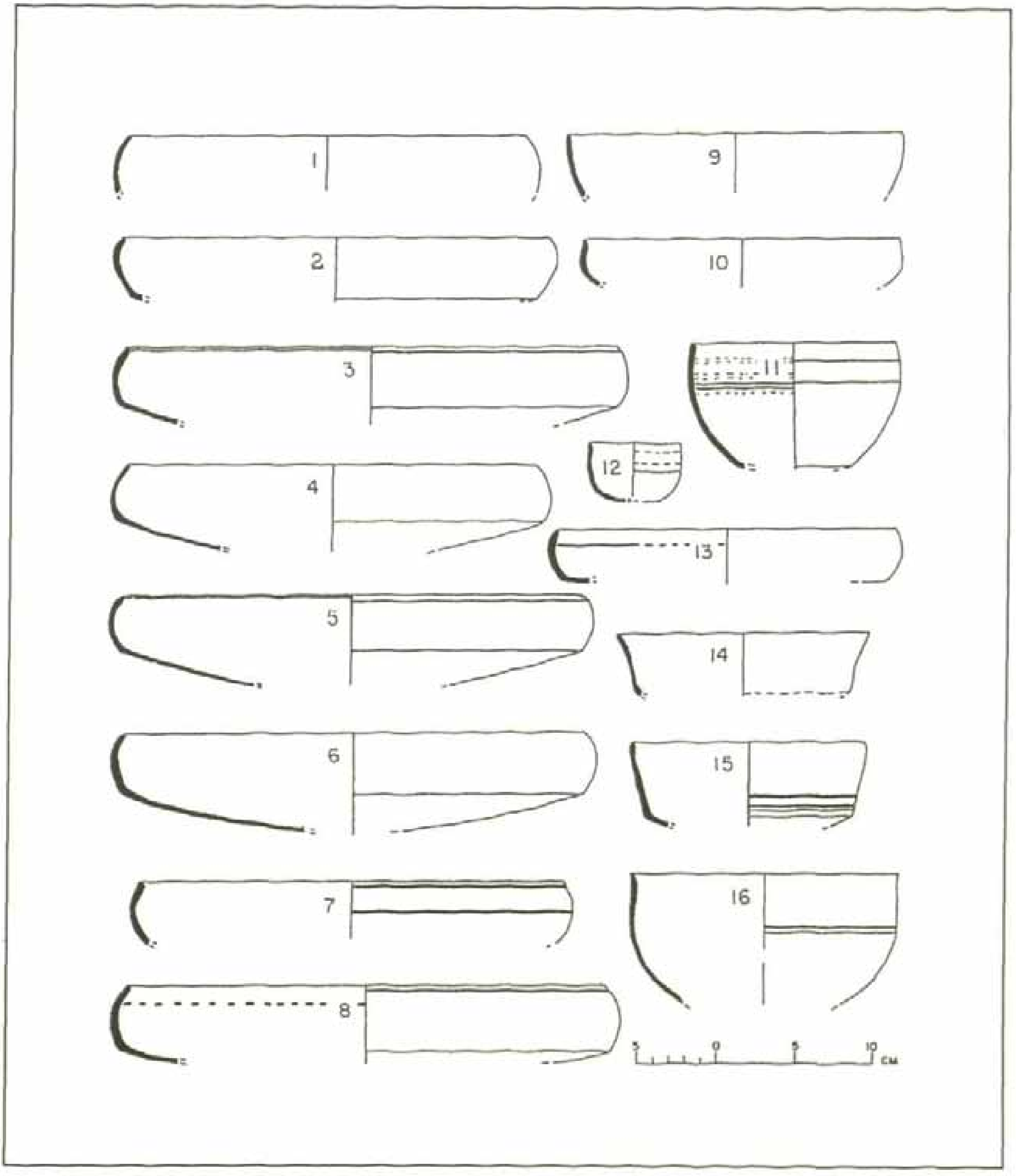


Fig. 18. *Sankisa : dishes and bowl, 1, 2 and 9 grey ware; 3-5 and 10, red ware; 6-8 and 11-16, black-slipped ware, PGW level*

collected from layer 5. The shapes comprised storage-jars with applique band at shoulder, perforated footed-bowl, fine convex-side i dishes, incurved bowls, cord and mat-impressed vases, medium-size vases with externally thickened rim, lids with half-folded rim, lids with flared rim, fine deep bowls, lipped-bowl, miniature pot and carinated-handi with externally thickened rim having mild depression on the exterior. Clay-lump with reed marks were also found. The black-slipped ware shapes included convex-sided dish with slightly thicker section. The shapes in PGW comprised convex-sided bowls having vertical strokes with black paint in the inner and angular strokes on the exterior, convex-sided bowls with black band on the rim, basal part of a bowl with red exterior and grey inner surface with circular bands in the middle and vertical strokes all around, a sherd having floral design made out of three hooks, dish with groups of vertical strokes on both the surfaces, bowl with black painted rim having vertical strokes below, followed by loops further below, sherds with vertical strokes on both the surfaces and one thick sherd with black painting. Associated grey ware shapes included convex-sided dishes and bowls, one with slight depression on the exterior side of the rim. Some pieces have either interior or exterior red surface. The same layer has yielded a few sherds of fine variety of black-and-red ware of which one is a convex-sided dish. A few sherds have outer black and inner red or grey surface. Some sherds of coarse variety of black-and-red ware have also been found.

More or less the same material have been found from the layer 6 of Qd 4 of Al. Red ware comprised fine red ware dishes and bowls, hand-made storage-jars, a few with applique bands at shoulder, small to large-size vases having prominent neck and some with externally splayed-out rim, hand-made vases with cord or mat-impressed shoulders, channelled-basins, perforated bowl, lid with folded rim, incurved bowls, convex-sided dishes and miniature pots. Shapes in PGW were however, not very clear and the paintings comprised vertical strokes, series of dots within two lines and floral pattern. Associated grey ware included convex-sided deep bowl and miniature pots. A few sherds have exterior dark and interior grey surfaces. Fine variety of black-and-red ware sherds comprising convex-sided dishes and convex-sided bowl with grooved exterior were also found. The black-slipped ware included bowls with semi-circular body, thick and thin convex-sided dishes, some of which contained mild depression on the exterior side of the rim, miniature bowl and bowls with concave profile. A few sherds with powdery ochre surface were also found from the lowest levels in Qd 3 of Square A 1. The lowest levels have yielded hopscotches made out of almost all the pottery types.

About three hundred and forty-three antiquities were found during excavation, besides a large number of antiquities collected from the surface during explorations of different areas of the site. Among the antiquities found from excavations, terracotta discs (hundred and five) form the largest group, with a variety of decorations. Antiquities in terracotta also included twelve broken pieces, mostly of figurines, nine human figurines (pl.XXVII, XXVIII and XXIXA), thirteen animal figurines (pl.XXIXB), sixteen toy-cart wheels, twenty beads, three ear-studs, fifteen bangle pieces, twenty-three sling-balls, six gamesmen, one whistle, one pestle and one rattle containing eight mini balls of clay. Among other antiquities mention may be made of twenty-six bone points, forty bone arrow-heads (pl.XXXA), seven copper pieces including nails, chisels and a piece of chain, fifteen beads of semi-precious stones like

agate, chalcedony, carnelian and quartz, crystal, one glass bead, three ivory objects including a pendant and a bead, three stone weights, two rubbing stones, two bone objects, one stone architectural fragment, one micro-bead of paste and one square copper coin.

The importance of excavation lies in the fact that this great city site has never been excavated earlier scientifically and no proper record of the exposed structures and antiquities or stratigraphy was so far available. Its location in a zone where cultural trends from different areas might have influenced the inhabitants during the protohistoric times also needed proper investigation possibly through a large-scale excavation of the mounds at the site.

64. EXPLORATION IN DISTRICT GHAZIABAD.— In the course of the exploration, G. N. Srivastava of the Agra Circle of the Survey, noticed an ancient habitation site near village Sudna in Hapur tehsil of District Ghaziabad. The site consisted of an extensive mound which has been levelled for cultivation by the owner of the land. At the site and in the subsequent earth filling to lower levels, potsherds and other terracotta objects like beads etc., have been noticed. Some stray bricks found at the site appeared typical of Kushan period.

65. EXCAVATION AT IMLIDIH KHURD, DISTRICT GORAKHPUR.—In continuation of the earlier work *(1991-92,* pp. 107-109 and 7 *992-93,* pp.92-93), the Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, Banaras, under the direction and co-direction of Purushottam Singh and Ashok Kumar Singh, assisted by R.N. Singh, Santosh Kumar, A.K. Pandey, Ram Badan and B.K. Sinha, resumed excavation at Imlidih Khurd. This ancient settlement, located on the left bank of the River Kuwana, a tributary of Ghaghara, about 35 km south of Gorakhpur, have furnished some significant details.

Designated as 'pre-Narhan' culture, Period IA was represented by 25 to 40 cm thick deposit. The structural activities of this period were only restricted to the reed-marked burnt clay lumps, indicating the existence of huts or wattle-and-daub houses.

The ceramic industry of this period comprised the cord-impressed pottery and plain red ware with spherical bowls, pedestalled-bowls, vases with flaring rim and expanded body, *handi-like* cooking vessels with out-turned rim, constricted neck and expanded body. Among other finds, mention may be of shallow-spouted bowl in red ware. The small finds comprised a large number of micro-beads of steatite, faience beads in limited quantity, plain and simple bone points and pottery discs.

Period IB — the overlap phase between pre-Narhan and Narhan culture, is marked by a spert of activities and a distinct change in the material culture. The life-style of the inhabitants of this sub-period essentially remained the same as indicated by the presence of post-holes, floors and lumps of burnt clay with reed-marks. But the introduction of black-and-red ware, typical of the Narhan culture, distinguished this sub-phase from the earlier one and the characteristic bowl of cord-impressed red ware, which was a hallmark of pre-Narhan culture during the earlier sub-phase, was also found in black-and-red ware. The other important features of this sub-phase were *lota-shaped* vessels of black-slipped ware with linear paintings in white on the exterior, pottery having post-firing designs, with geometrical motifs on the exterior of the pots, such as dots, dashes, sigmas and wavy lines. The small finds included beads of steatite, terracotta and semi-precious stone, bone points, arrow-heads, and pottery discs.

Period II is represented by the remains of Narhan culture, comprising post-holes and well laid-out floor measuring 4-20x4-10 m, having a thickness of 15 cm. Special mention may be made of the discovery of three silos or grain bins. The characteristic pottery of this period comprised the white painted Black-and-red ware, black-slipped ware, red-slipped ware and red ware. Among the small finds, beads of steatite, semi-precious stone, terracotta, bone points and arrow-heads besides pottery discs are noteworthy.

The uppermost layers at the site have been disturbed to a great extent due to agricultural activities for which the site revealed no substantive evidence on the fall of the Narhan culture. Although actual sherds of NBP Ware have not been recovered from the excavated trenches, but almost all other ceramic industries associated with this ware were present in the uppermost layers. These comprised black-slipped ware, grey ware and red ware, suggesting the site being left unoccupied for almost two centuries which was again inhabited sometime during the sixth century BC.

66. EXCAVATION AT AUNAHAN, DISTRICT KANPUR DEHAT.— The Lucknow Circle of the Survey, under G.T. Shendey, led by S. Jamal Hasan, assisted by Indu Prakash, A. A. Hashmi, Rajeev Dwivedi, S. B. Shukla, Sultan Singh, Shakeel Ahmad and Dinesh Goswami, conducted trial-excavation at Aunahan (Long. 79° 56' 45"; Lat. 26° 37' 45").

The village Aunahan, located approximately 60 km west of Kanpur City and 4 km north of Gahira is on the Rura-Sheorajpur metalled road. The site could be approached by bus upto Gahira from Kanpur-Bela-Bidhuna Road wherefrom one has to hire a Tonga or walk on foot upto the village.

The mound is on the western fringe of the village. A *laigejheel* known as Magahi runs along the east-west axis of the mound. The *jheel* might have served as a major source of water in bygone days and also as a moat for defence purpose.

Adjacent to the mound, on the west side, is a park being developed by the Department of Forest, Uttar Pradesh and on the north, there is agricultural land while the village is situated on the east and north-east.

The total area of the mound is approximately 27 *bighas* with a maximum height of 12 m from the ground level. The height varies on different contours. A major portion of the mound on the eastern side has been occupied by an ancient *haveli* and a Primary School.

In all three trenches namely ANH I, ANHII and ANH III were sunk to assess the potentiality as well as the cultural sequence of the site. The Trench ANH I is located at the top of the mound, ANH II at the middle of the slope towards western side and ANH III on the northwestern edge. Except in ANH III, the natural soil in other trenches could not be reached due to paucity of time as also for the structures coming across. The habitational deposits could be divisible into five periods *viz.,* Period I: Mauryan, *circa* fourth century BC to first century BC; Period II: late phase of Kushan, third century AD; Period III: Gupta and post-Gupta, *circa* fourth century to seventh century AD; Period IV : early medieval, *circa* eighth century to twelfth century AD; Period V : Sultanate, *circa* twelfth century to fifteenth century.

In a very restricted area (ANH III) on the northwestern edge of the mound, about 1 m deposit was noticed while section scraping just overlying the natural soil, revealed a few plain red ware sherds of early historical period. The shapes included incurved bowls, dishes, basins and vases with better finish. Antiquities from the deposit consisted of only one bone arrow-head and a terracotta hopscotch. No structural remains could be encountered in this period. However, on typological ground, the material remains of this period could safely be assigned a time-bracket from *circa* fourth century BC to first century BC.

Period II represented by a 30 cm deposit (layers 6 and 7) at ANH II have been assigned a time, i.e., *circa* third century AD. There was a gap of more than 2m between the earliest exposed level of ANH III and ANH II. This deposit was characterized by a red ware pottery of late phase of Kushan period which comprised bowls with central knob, bowl-cum-lid, a fragmentary sprinkler and different varieties of basins, vases, dishes, etc. and single sherd bearing a stamp design. Only antiquity recovered from the deposit was a terracotta hopscotch. Although the deposit of Period II was devoid of structures, in later period, structures of re-used Kushan bricks have been encountered.

The average occupational deposit of Period III (layers 3-5, ANH II and layers 4 and 5, ANH I) was about 1 -90 m (fig. 19), represented by red ware with medium to coarse fabric. The shapes comprised bowls of different types including the knife-edged ones, vases, *handis,* basins, troughs and spouted vessels. This period was also marked by the presence of terracotta animal figurines and wheel, broken iron objects and a bone pendant.

Burnt-brick structures built of re-used bricks in ANH II were exposed partially. Two walls of a structure with twelve courses, have been noticed (fig.20). The bricks were laid in mud-mortar with their size ranging from 33 to 36 cm in length, 20 to 24 cm in width and 5 to 7 cm in thickness. Mention may be made of a partially-exposed structure in ANH I (1 -50 m) with a corbelled arch (figs. 19 and 20)? The confirmation of which could be possible only after the complete exposure of the structure. In all, thirteen courses of this brick (33x5-5x6 cm) structure could be exposed.

Another structure running north-south in the same trench contained two courses of reused bricks measuring 22x 18x5 cm with a total length of 1 -50 m and a width of 34 cm. Adjacent to this wall, were five bricks laid in brick-on-edge pattern, three along the wall and one each on its two sides resembling a niche which could have served ritualistic purpose.

The occupational deposit of Period IV was about 1 -80 m in thickness (layers 1,2 of ANH II and layer 3 ANH I) was marked by the occurrence of red ware pottery consisting *of handis,* bowls, dishes, vases including spouted vessels and terracotta finial etc. The pottery was mostly of dull red ware with a coarse fabric.

The antiquities comprised terracotta objects such as, gamesman, grinder, ear-studs, balls, beads, animal figurines, skin-rubber, wheels, iron objects, glass and lac bangles, stone pendant and stone object with engraved designs (pl.XXX B-C) typical of this period. Burnt-brick structures, laid in mud-mortar, were also noticed in this period. The bricks were mostly the reused ones. No complete plan of structure could be noticed due to the limited nature of excavation.

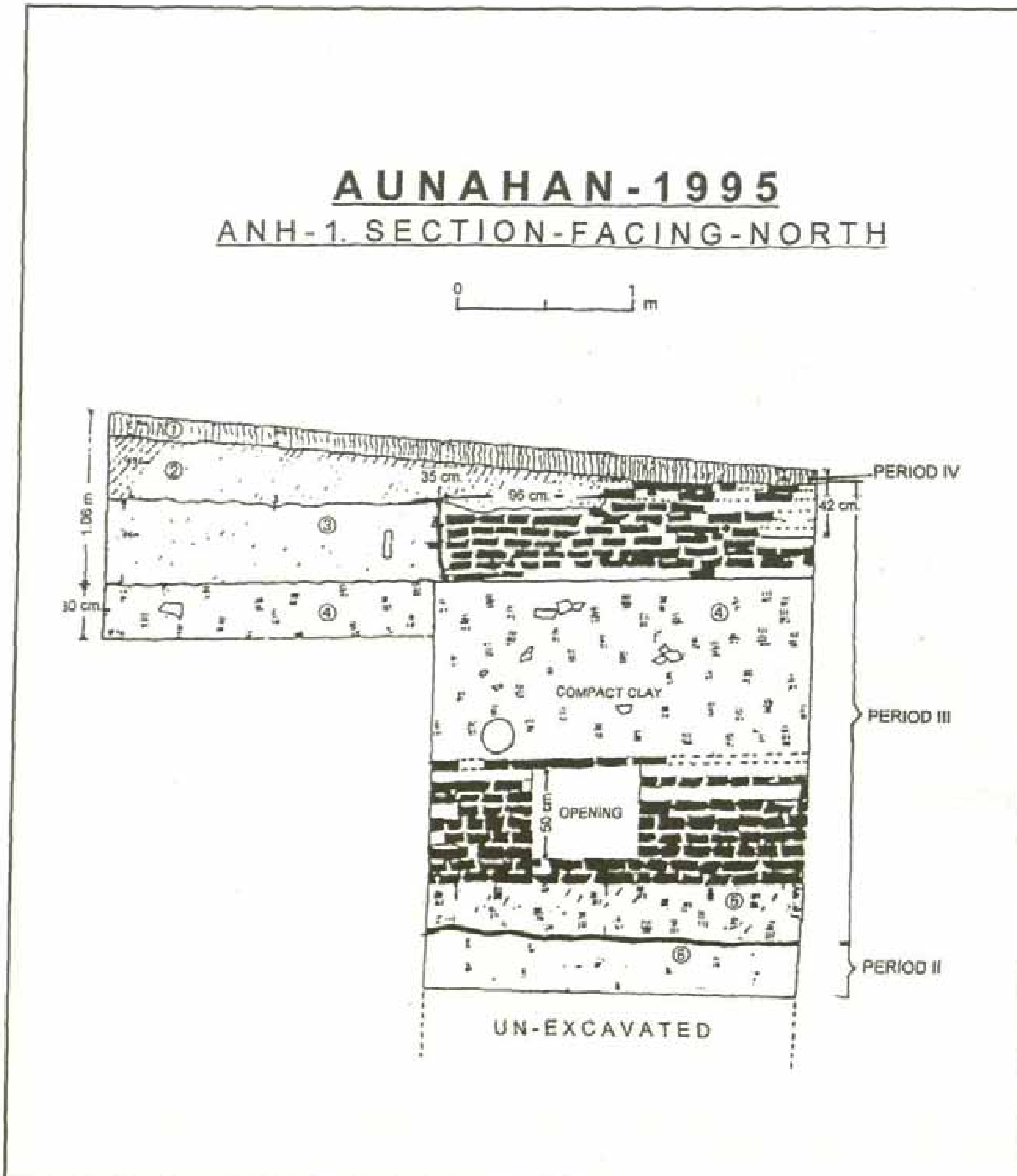

AUNAHAN - 1995
ANH - 1. SECTION - FACING - NORTH
0
1 m
1.06 m
30 cm.
35 cm.
96 cm.
42 cm.
PERIOD IV
PERIOD III
PERIOD II
COMPACT CLAY
50 cm
OPENING
UN-EXCAVATED

Fig. 19

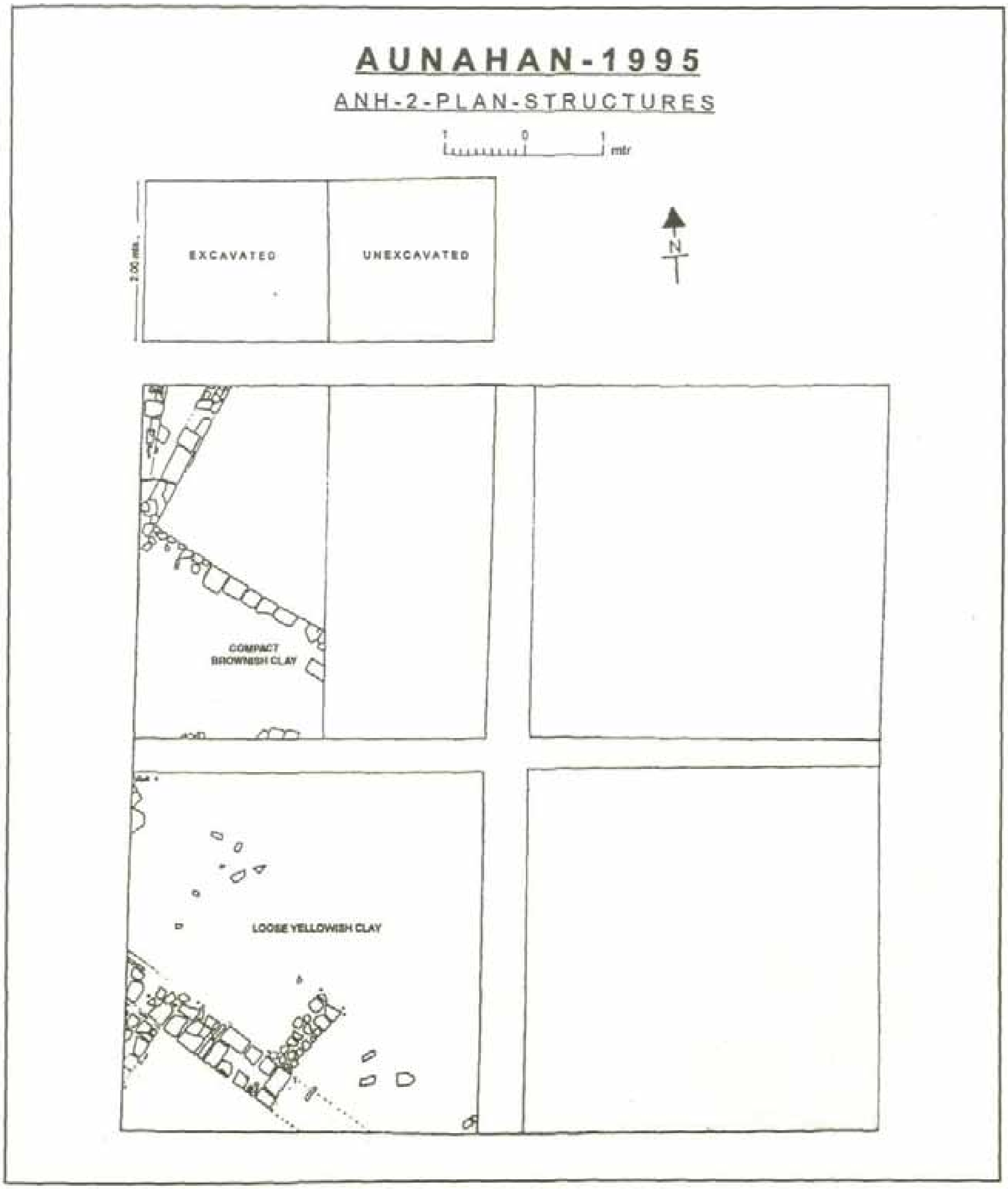

AUNAHAN-1995
ANH-2-PLAN-STRUCTURES
1 0 1 mtr
2.00 mts.
EXCAVATED
UNEXCAVATED
N
COMPACT BROWNISH CLAY
LOOSE YELLOWISH CLAY

Fig. 20

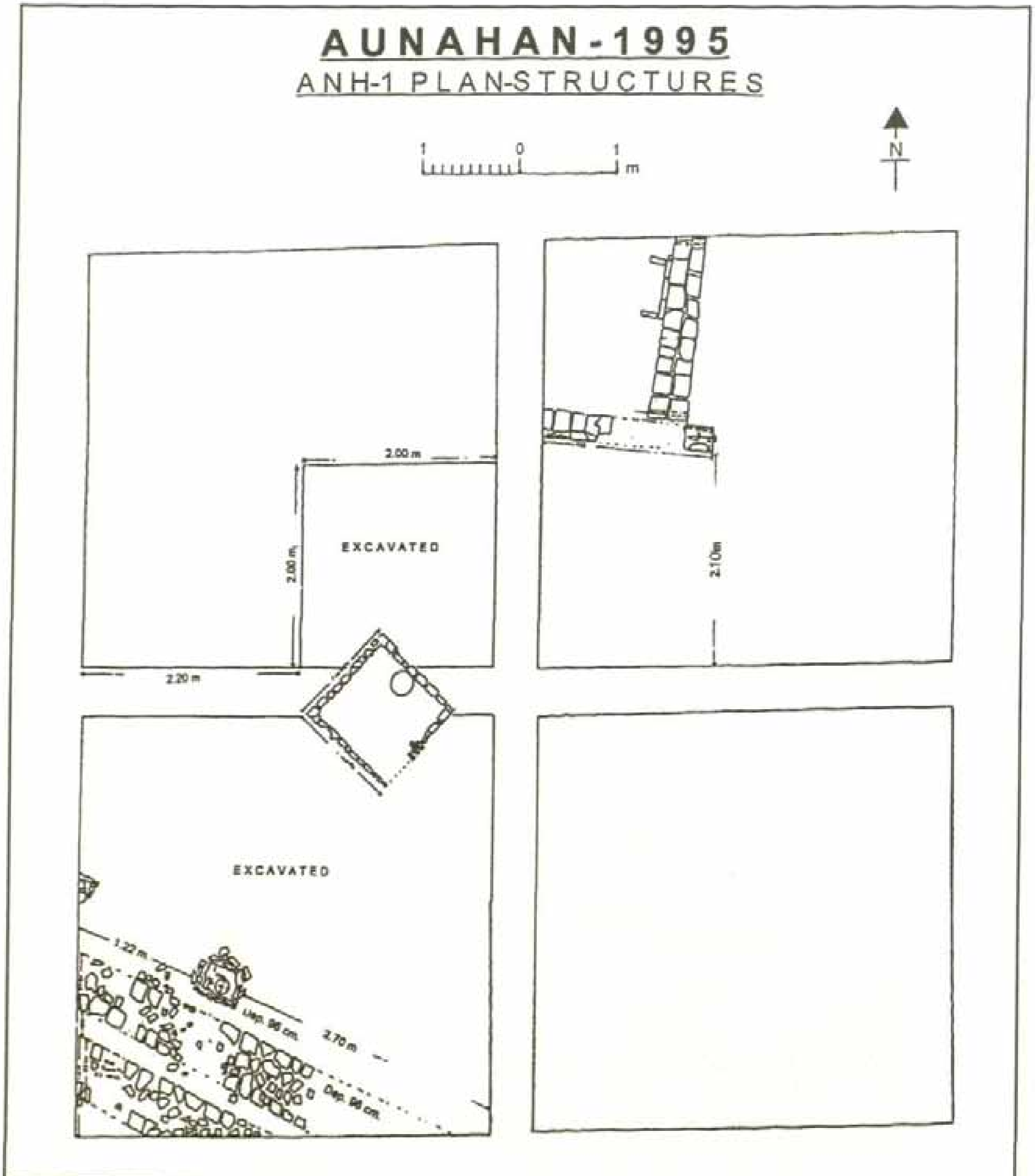

AUNAHAN-1995
ANH-1 PLAN-STRUCTURES
1
0
1
m
N
2.00 m
EXCAVATED
2.00 m.
2.10m
2.20 m
EXCAVATED
1.22 m
2.70 m

Fig. 21

Period V was the last occupational period of the site which could be datable between *circa* twelfth century and fifteenth century AD on the basis of potsherds and other cultural remains recovered from this level. Approximately 1 m deposit represented by layers 1 and 2 of ANHI have yielded red ware potsherds with a number of utilitarian shapes including bowls, dishes, *handis,* vases, *chilams,* storage-jars, etc., of different types and sizes. The antiquities from Period V comprised terracotta animal figurines, glass bangles etc (pi. XXX B-C) . The structures of re-used bricks were also noticed just on the top of the mound (fig.21). Special mention may be made of one small-sized structure with six courses, measuring 96x89 cm, roughly square on plan and was built of broken bricks (w 5 cm). There was also traced a hole (dia 26 cm) with ashy deposit.

67. EXCAVATION AT MUSANAGAR, DISTRICT KANPUR DEHAT.— In continuation of the earlier work *(1994-95,* pp.74-76), the Department of Archaeology, Government of Uttar Pradesh under the direction of Rakesh Tewari assisted by R. K. Srivastava and K. K. Singh, conducted excavation at Musanagar mound in Bhognipur tehsil. The following cultural sequence, further confirmed the result of the previous year.

Period I	:	Red ware, black-slipped ware, black-and-red ware
Period II	:	Black-slipped ware, red ware, black-and-red ware and PGW
Period III A	:	Black-slipped ware, red ware, black-and-red ware, PGW and NBPW
Period III B	:	Black-slipped ware, red ware, black-and-red ware and NBPW
Period IV	:	Red ware (Sunga and Kushan)
Period V	:	Gupta and post-Gupta

Period I, consisted of about 40 cm deposit with thick loose blackish earth. The main ceramic industries of this period were red ware, black-slipped ware and black-and-red ware.

Red ware of both varieties, i.e., hand-made and wheel-turned, were found. The shapes which comprised water-vessels, storage-jars, convex-sided dishes and deep vertical-sided bowls. Most of the dishes have slightly out-turned rim with rounded flat base. Black-slipped ware comprised convex-sided dishes with carinated flat base besides, globular and hemispherical bowls. But the sherds of black-and-red ware did not reveal any exact shape of which only a few specimens were burnished.

The presence of burnt clay lumps with reed impressions and post-holes indicated that the structures of this period were made of wattle-and-daub. Other cultural material comprised terracotta sling-balls, bone points, terracotta beads, etc. A number of charred-bones were also collected from the deposits of this period.

Period II is characterized by the appearance of fine PGW along with the ceramic types found in Period I. Black-slipped ware consisted of convex-sided dishes and bowls while no distinct shape could be noticed in black-and-red ware. Red ware consisted of storage-jars, water vessels, miniature pots, convex-sided dishes, straight-sided deep bowls, etc. Black-and-red ware was present only in a limited proportion. Post-holes and burnt clay lumps were found in the deposits of this period also.

NBPW made its appearance in Period III, the lower levels of which comprised a few sherds of PGW that discontinued in the upper levels. On the basis of above finds this period could be divided into two sub-phases III A and III B.

Upper levels of Period III B revealed structures of kiln-burnt bricks. Other finds included the terracotta sling-balls, disc, bone points and terracotta human figurines.

From Period IV was recovered a red ware in different shapes, such as carinated bowls, inkpot-type lids, straight-sided bowls, sprinklers, high-necked water vessels, sometimes bearing stamped designs, basins, storage-jars, *lotas,* miniature pots etc. Other ceramic types, reported in the lower levels, almost disappeared.

The structures of kiln-burnt bricks, approximately measuring 34x26x8 cm indicated three phases. The floors were generally treated with brick-jelly, bricks and mud mixed with lime. Other objects included terracotta human figurines, copper and iron artefacts, coins etc.

In Period V, there was presence of a red ware, representing water vessels, big storage-jars, bowls and button knobbed-lids. Another interesting find was that of a typical pottery made of husk-mixed clay, treated with some glazed material. The structures of this period were of broken bricks of earlier periods.

68. EXPLORATION IN DISTRICT LALITPUR.— During the course of his exploration, Ambika Prasad Singh of the Regional Archaeological Unit, Jhansi, of the Department of Archaeology and Museums, Government of Uttar Pradesh, under the direction of Rakesh Tewari, noticed the following antiquarian remains in Talbehat tehsil of Lalitpur.

Village	*Nature of remains*
Bijrautha	Images of Lakshmi-Narayana and Tirthankara in a modern temple
Chandrapur	Sculptures of Uma-Mahesa, Vishnu, Parvati and *seshasayi*- Vishnu
Khiria	Medieval sculpture of Uma-Mahesa
Myaya	Medieval fragmentary sculptures of Surya, Brahma, Vishnu and Siva

Village	*Nature of remains*
Piparai	Remains of two stone temples (Gondwani style), *circa* eleventh-twelfth century
Talbehat	Fort built by the King Bharat Shah, *circa* AD 1619; ruins of a medieval temple; *sahasra-linga* and *nandi*
Tenta	Jaina temple, *circa* eighteenth century; inscribed *sati-sXone;* images of Tirthankara, Surya, fragmentary *Sapta-matrika* panel depicting Vainayaki, Chamunda and Indrani

69. EXPLORATION IN DISTRICT PITHORAGARH.— During the course of exploration, the Regional Archaeological Unit, Almora, of the Department of Arch .eology, Government of Uttar Pradesh, under Hemraj and Rakesh Tewari, assisted by Suresh Kumar Dubey, surveyed two hundred and forty villages in Gangolihat tehsil in District Almora. A list of sites with archaeological remains is given below.

Village	*Nature of remains*
Agron	Temple remains and a standing image of Vishnu in stone, medieval period
Aulia gaon	Stone sculptures of Vishnu in standing and reclining position, Varaha, Vamana and Parvati, ninth-tenth century; one stone *\eera-khamba,* late medieval period
Bankot	Stone sculpture of Krishna lifting *govardhana, circa* ninth century
Bans Pathan	Fragments of pots, unidentified cylindrical objects of steatite, red ware and iron arrow-head, medieval period
Baroli Sera	Fragmentary stone sculpture of *seshasayi-*Vishnu, fragments of stone sculptures and *amalaka* of a temple, *circa* tenth-eleventh century

Village	*Nature of remains*
Bhatigaon	Three stone sculptures of Vishnu in standing and reclining position kept in three *naulas* (water source), *circa* tenth-eleventh century
Bhyun	Fragmentary stone sculptures of Vishnu and Surya
Boyal	Red ware and a stone *veera-khamba,* medieval period
Devarari Bora	Six stone sculptures of Chamunda, Ganesa, Varaha and Parvati, *circa* ninth to eleventh century
Devarari Pant	Eleven stone sculptures of *Vamsin-avatara,* Vishnu in standing and reclining position, Yoga-Narayana, Ganesa, Ganga, Uma-Mahesa, Surya and Lakshmi-Narayana
Gwari	Thirteen stone sculptures of Garuda in human forms, standing images of Vishnu, Parvati, Agni, Vamana, Trivikrama, Krishna, Ganesa and Varaha, *circa* ninth to eleventh century
Hatkeswar	Standing sculpture of Vishnu in stone, medieval period
Jeeval	Two stone *naula* (water sources) with a stone sculpture of Vishnu, *circa* fourteenth century; one stone *veera-khamba,* sixteenth century
[Ju]Jut	Icons of Parvati, standing Vishnu, Lakshmi-Narayana, Varaha and fragmentary sculptures in stone, early medieval period
Khirmande	Three stone sculptures of Parvati, Ganesa and Vishnu, early medieval period
Koirali	Stone sculpture of Ganga, *circa* tenth century
Kuna	Stone sculpture of Parvati, *circa* tenth century
Mallagarkha	Three stone sculptures of Siva, Lakshmi-Narayana and *ganas, circa* tenth-eleventh century; a stone *veera-khamba,* late medieval period

Village	*Nature of remains*
Nakot	Stone sculpture of Vishnu, *circa* tenth century; two stone *veera-khambas, circa* sixteenth century
Naukhuna	*Stonejaladhara* and *naula* (water source), two stone sculptures of Parvati and Vishnu of medieval period
PipalKheta	Stone sculptures of standing Vishnu, Mahishamardini, Ganga, Ganesa and fragmentary pieces, early medieval period
Raiagar	Two stone *veera-khambas* depicting warriors holding sword and shield of late medieval period
Sera ghat	Fragmentary sculptures and four-faced Siva-*linga, circa* tenth century
Simalata	Stone pillars carved with vase and foliage designs and remains of a medieval temple

70. EXPLORATION IN DISTRICT RAEBARELI.— During the course of his exploration, Rajib Kumar Trivedi, under the supervision of P. K. Singh and Rakesh Tewari of the Department of Archaeology and Museums, Government of Uttar Pradesh, reported the discovery of the following sites of archaeological importance in Bacharawan block of Maharajganj tehsil.

Village	*Nature of remains*
Bahadurnagar	Remains of a temple, eighteenth century
Devapuri	Red ware, late medieval period
Dostpur	Siva temple, eighteenth century
Hasanganj	Temple, nineteenth century
Ichauli	Stone sculptures
Ieego	Stone sculptures
Karanpur	Temple, nineteenth century
Kundanganj	Siva temple, nineteenth century

Village	*Nature of remains*
Mainahar Katan	Siva temple, nineteenth century
Malhipur	Temple, eighteenth century and stone sculptures
Mubarkapur sapo	Red ware, black-and-red ware
Neemtikar	Siva temple, eighteenth century
Pastaur	Stone sculptures
Peethan	Stone sculptures
Raja Mau	Siva temple, eighteenth century
Sahgo-Khanpur	Stone sculptures
Sahgo	Stone sculptures
Saraura	Stone sculptures, bricks and red ware
Thulendi	Temple, nineteenth century

71. EXCAVATION AT RAJA NALA-KA-TILA, DISTRICT SONBHADRA.— The State Archaeological Organization, Uttar Pradesh, under the direction of Rakesh Tewari and Rakesh Kumar Srivastava, assisted by K.K. Singh, Balram Krishna, Ram Gopal Misra and M. N. Dimri, carried out excavation at the ancient site of Raja Nala-Ka-Tila, with a view to ascertaining the cultural sequence of the site.

The excavation was conducted in the northern, southern and eastern areas of the mound in the trenches measuring 5x5 m (2), 500x26 m and 5x5 m, respectively. Vertical digging revealed a cultural deposit of about 315 m which on the basis of comparative study of stratigraphy and finds, could be tentatively classified in three periods.

Period I represented by a deposit of about 100 m, has been found devoid of any metallic remains, atleast in the first season's work. The main ceramic industries included black-and-red ware, black-slipped ware, red ware, grey ware and black ware. Rusticated, rippled and burnished varieties were present in considerable proportion. Corded ware, however, was very rare. The main shapes were bowls and water vessels, storage-jars and a few miniature pots. A few sherds bear paintings, generally executed in black pigments. Post-firing incised designs were also recovered. Except the depiction of a deer, all such decorations comprised geometric patterns.

The structural remains were marked by a few post-holes and burnt clay lumps bearing reed marks. Floors were not well marked because of the compressed nature of the surface and

signs of burning. Burnt patches, charred and carbonized bones and cereals, besides other botanical remains were found in considerable proportion. The occurrence of baked and unbaked cylindrical mud bases was interesting. Such bases are still being used to support *kothilas* in the Talla village in order to prevent rats and termites. Terracotta *kothilas* of different sizes are used even today in the north Indian villages for storing grains, cereals, etc. Almost every village-house contains one or more such structures. Other associated material included lithic artefacts *viz.,* a few chips, a finely made sling-ball, shell, terracotta beads and discs, a few broken bone points and arrow-heads.

Period II was marked by the appearance of iron from the lowest to the top levels in a deposit of about 1-00-1-25 m, comprising nail, sickle, knife, arrow-head, spear-head, chisel etc. A new type of black-slipped ware appeared in this period while the earlier varieties of black-and-red ware, black-slipped ware increased considerably. The main shapes included bowls, dishes, vases, conical pots, perforated pots, button-based goblets, footed-bowls, etc. The paintings comprised mainly geometric patterns and linear designs.

The structural remains were almost similar to that of the preceding period. A few floors, prepared with rammed earth mixed with potsherds, bearing evidence of burning activities and pots were also traced. Besides, there were signs of treatment of floor with burnt clay. Burnt clay nodules with reed marks were indicative of wattle-and-daub structures. The cylindrical terracotta bases continued to appear in a group of two, three or four. Pit-hearths, broken pieces of mud-hearth, burnt patches filled with ash and broken pottery, besides carbonized cereals have also been found. There was increase in proportion of charred, carbonized and plain bones. The bone points and arrow-heads were found in greater number. Other associated finds included shell, stone-chips, terracotta beads, etc. A triangular stone object having a depression on ventral side was found along with a white pebble exactly of the same size as that of the depression. These artefacts might probably represent the proto-Siva-linga and *argha.* Remains of an antler with apparent cutting mark and jaw with teeth were also collected.

Period III is characterized by the appearance of NBPW and its contemporary pottery, besides other associated wares, like black-and-red ware, red ware, grey ware, rusticated ware and a few corded ware etc. There was noticed increased number of dishes, mostly the convex-sided ones, in addition to the different types of bowls, big storage-jars, basins and miniature vessels in good proportion.

Post-holes and clay lumps with reed marks indicated that the structures were made of wattle-and-daub while the floors were similar to that of the Period II. Noteworthy antiquities comprised iron objects, stone artefacts, beads, anvils, etc., terracotta beads, discs, pottery discs and wheels, hopscotches, bone-awls and arrow-heads. Remains of bone were however, found in abundance.

The uppermost levels of Period III were often found disturbed due to the agricultural and other activities on the surface as a result of which even material from medieval and later periods could also be seen on the surface.

72. EXPLORATION IN DISTRICT SULTANPUR.— Indu Prakash of the Lucknow Circle of the Survey, noticed the following antiquarian remains in District Sultanpur, during the village-to-village survey.

Village/Site	*Tehsil*	*Nature of remains*
Apohia	Gauriganj	Mound yielding early historical and medieval pottery; stone sculptures of Vishnu, Hanuman and Mahesvara of medieval period
Bhatgawan	-do-	Mound yielding black-slipped ware, NBPW and a brick-built tank of nineteenth century
Jamon	-do-	Mound yielding early historical pottery and structural remains of late medieval period
Katari	-do-	Mound yielding medieval wares
Rajgarh	-do-	Mound yielding historical pottery and stone sculptures ranging from Gupta to medieval period
Ramjhahpur	-do-	*Samadhis* of local Zamindar and Ghazi Mian-ki-Mazar of nineteenth century
Richaura	-do-	Mound yielding medieval wares
Rohri Buzurg	-do-	Mound yielding red ware pottery of medieval period

73. EXPLORATION IN DISTRICT SULTANPUR.— A. P . Ojha of the Department of Ancient History, Culture and Archaeology, University of Allahabad, Allahabad, discovered the site called Bisani (26° 14' 30 " N; 82 ° 3' 30" E), near Piparpur Railway Station on the Allahabad-Faizabad Road in Sadar tehsil of the district. The ancient mound is on the bank of a horse-shoe lake, most part of which has been filled up. However, the general profile of the lake becomes very clear during the rainy-season. The mound extends about 500 metres north-south and 250 metres east-west. The height of the mound is approximately 3 metres from the surrounding area.

The exploration of the mound yielded red ware pottery comprising convex sided bowls, with externally thickend or clubbed-rim, shallow bowl with knife-edged rims and thick flat-base, dishes with internally rolled-rim, undercut ring and flattened vase; basins with collared or nail-headed rim, storage-jars with collared-rim and sprinkler. Besides pieces of Kushan pottery, like the knife-edged bowls have also been found. The incised

decorations such as, criss-cross or checkered patterns, etc., occurred mostly on the external surfaces of the sherds. As evident from the occurrence of chocolate slip, the sherds appeared to represent the Kushan pottery. In addition, a few fragments of medieval glazed pottery, straight-sided trough with externally thickened rim and a terracotta animal figurine, possibly a dog, comprised other finds. On the basis of medieval pottery and antiquities the site could be datable between AD 1000 and 1500.

74. EXPLORATION IN DISTRICTS TEHRI GARHWAL AND UTTAR KASHI.— S. N. Kesarwani, assisted by S. O. Rastogi and R. S. Balodi, under the guidance of P. B. S Sengar, of the Agra Circle of the Survey, conducted extensive explorations on the banks of Rivers Bhagirathi and Bhilangana in the Districts of Tehri Garhwal and Uttar Kashi which are likely to be submerged under Tehri Dam (fig. 22). The submersible area covered a span of approximately 75 km commencing from the village Dharasu on the Bhagirathi river to Ghansali on the Bhilangana river. Main objective of the present exploration was to ascertain the archaeological evidence and proper preservation of the cultural heritage of the area before submergence under Tehri Dam. During the course of exploration in District Tehri Garhwal, architectural and sculptural remains of different periods ranging from *circa* eighth to the nineteenth century AD were noticed at Tehri city, Mali Deval, Hatwalgaon, Deval, Saingaon, Pilkhi and Bour etc.

Tehri city on the confluence of two Rivers Bhagirathi and Bhilangana, has a series of religious and secular buildings, amongst which the temple-complex of Shri Badrinath, Kedarnath, Satyesvara Mahadeva and Raghunathji mark special significance. The Badrinath-Kedarnath Temple-complex built by Maharani Guleria, wife of Maharaja Pratap Shah is distinguished by its intricately carved wooden doors, windows, brackets and pillars which are representations of the rich craftsmanship of Tehri. In the premises of the temple, a few rare images of Yoganarayana Vishnu, Lakshmi and *seshasayi*-Vishnu could be noticed. These*panchadhatu* images could be assignable to the seventeenth century. *Inpatwari mohalla* of the city a few more Brahmanical sculptures and architectural members were noticed which bear great archaeological significance. Amongst these, four armed Harihara (pl.XXXIA), Ganesa and Vishnu, all datable to *circa* ninth-tenth century are noteworthy.

Antiquarian remains at the village Mali Deval mainly include an early medieval temple dedicated to Vishnu (pl.XXXIB), which is a fine specimen of Indo- Aryan style of temple architecture prevalent in the hilly area. It consists of a *tri-ratha garbhagriha* with curvilinear *nagara sikhara,* an *antarala* and a closed *mukha-mandapa* on plan above a *high jagati,* approached by a flight of steps on the west side. Main shrine of the temple shows simple mouldings at the base and the top of its plain wall while the curvilinear *sikhara* over it is built in five *bhumis,* as marked by a series of four *bhumi-amalakas* on its *Venukosa.* It enshrines a standing image of Lakshmi-Narayana, Siva and seated Ganesa. On southern wall of the main shrine a five-lined inscription in Nagari script has been noticed. Architecturally, the temple may be dated to *circa* ninth-tenth century.

A miniature stone temple of early medieval period at Deval village, about 17 km from Tehri on Tehri Ghansali Road, has a single square chamber only with opening on the west side. In front of the cell exists a detached *mandapa* without having any architectural significance, which has been added later. In the temple-complex, about a dozen stone sculptures datable to *circa* ninth-tenth century, have been noticed, amongst which the images of Ganesa, *seshasayi-* Vishnu, Mahishamardini

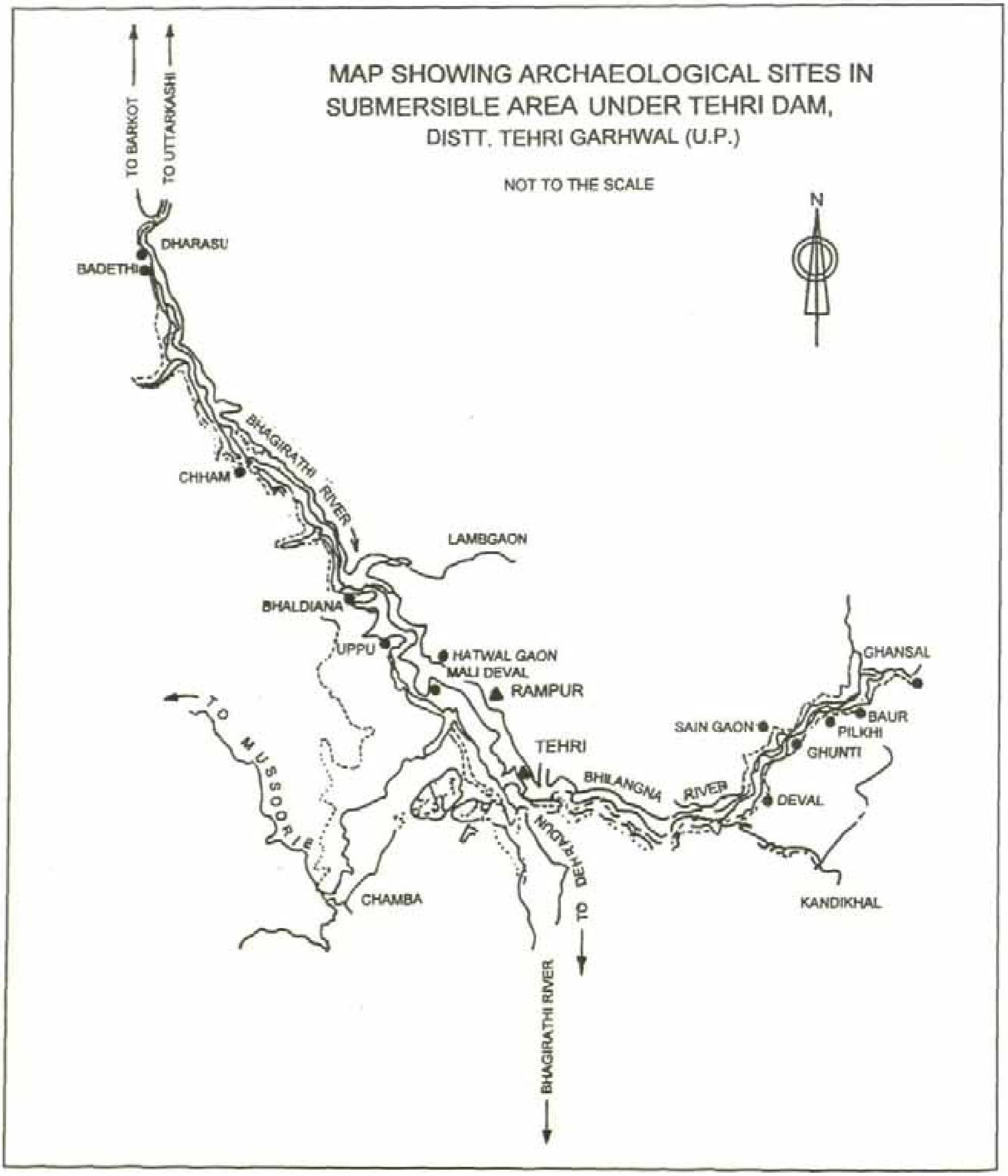

MAP SHOWING ARCHAEOLOGICAL SITES IN
SUBMERSIBLE AREA UNDER TEHRI DAM,
DISTT. TEHRI GARHWAL (U.P.)
NOT TO THE SCALE
N
TO BARKOT
TO UTTARKASHI
DHARASU
BADETHI
BHAGIRATHI RIVER
CHHAM
LAMBGAON
BHALDIANA
UPPU
HATWAL GAON
MALI DEVAL
RAMPUR
TO MUSSOORIE
TEHRI
BHILANGNA RIVER
SAIN GAON
GHANSAL
BAUR
PILKHI
GHUNTI
DEVAL
CHAMBA
TO DEHRADUN
KANDIKHAL
BHAGIRATHI RIVER

Fig. 22

and Chamunda etc., are noteworthy. Most important find comprises a seated four-armed Ganesa, carved in black polished stone, particularly due to its exquisite finish and fine modelling.

The sculptural remains at village Saingaon mainly included images of four-armed Mahishasuramardini (pl.XXXIC), *seshasayi*-Vishnu, Ganesa and *eka-mukha Siva-linga* etc., which were found scattered in and around the Chandresvara Mahadeva Temple.

An image of Parvati in a panel, enshrined in a small modern temple of Baur village, depicts two-armed goddess seated *inyogasana* above lotus pedestal and a *Siva-linga* below. The deity is flanked by two female attendants standing in *dvibhanga* posture on either side holding *chauri,* flying *vidyadharas* bearing garland are at the top corners. The goddess is decked gracefully with *kuntala, mukuta, bundalas, hara* and long *mala.* Stylistically, the image is datable to *circa* ninth-tenth century (pl.XXXID).

During the course of exploration on the banks of River Bhagirathi in Uttarkashi, architectural and sculptural remains were noticed at Dharasu and Badethi villages. Sculptural remains from Dharasu, which also marks 'O' point of submersible area, mainly comprised rare idols of Chamunda, Lakshmi-Narayana, Mahishamardini and Ganesa. Besides the idols, four beautifully carved stone-pillars of an early medieval Hindu temple were also encountered of which two are now fixed in a small shrine of recent origin while the remaining two were found scattered just outside it. All the stone pillars were beautifully carved with the*patralata, kirttimukha, ghanta kinkinika* and *ghata-pallava* designs in typical Pratihara style of Central India and Rajasthan.

In the locality called Hitara in village Badethi, about 3 km from Dharasu, the remains of a small Brahmanical temple have been noticed in dilapidated condition. It is an example of a *mandapa-type* shrine, mostly prevalent in Central India during the eighth-ninth century. It is 1 -25 m square in plan with opening on the east side. The front pillars of the shrine, now displaced from their original position are exquisitely carved with the *patralata* design, chain and bell designs issuing from the *kirttimukhas, ardhapadma* motif and *ghata-pallava* designs in low relief.

WEST BENGAL

75. EXPLORATION IN DISTRICT BANKURA.— In continuation of the last year's work *{1994-95,* p.79), T. J. Chakraborty of the Calcutta Circle of the Survey, carried out village-to-village survey, which brought to light the following sites of archaeological importance.

Police Station	*Village*	*Nature of remains*
Bishnupur	Amral	One *deul* type Siva temple, two *chala* type Siva temples and four other temples in a row, late medieval
-do-	Baidanga	Temple and *rasa-mancha,* late medieval
-do-	Bhara	Number of brick-built temples and a *rasa-mancha,* late medieval

Police Station	*Village*	*Nature of remains*
Bishnupur	Birra	Brick-built Janardana Temple and brick-built *chala* type temple, late medieval
-do-	Chakrahu	Temple of late medieval period
-do-	Chuamasina	Two late medieval temples
-do-	Govardhanpur	*Chala* type Vishnu temple, late medieval
-do-	Kalika	*Rasa-mancha,* late medieval
-do-	Muchdanga	Flat-roofed Vishnu temple, late medieval
-do-	Nanikola	Late medieval temple

76. EXCAVATION AT JAGAJJIBANPUR, DISTRICT MALDA.— In continuation of the previous works, the Directorate of Archaeology and Museums, Government of West Bengal, under Gautam Sengupta, resumed an extensive excavation at the site Tulabhita in the village called Jagajj ibanpur. The main objective of this year's work, directed by Amal Roy, was to ascertain the lay-out of the buried monastic-structures as well as the sequence of the site. The small-scale excavation carried out earlier, already provided evidence of the Buddhist establishment at Tulabhita, datable to the ninth century, of the time of Pala ruler Mahendrapaladeva, son of Devapala, as referred to in the Jagajjibanpur copper plate, discovered accidentally in 1987 from the site. Excavation in twenty-four trenches (600x6-00 m), covering an area of 864 sq m, brought to light apart of the brick-built monastery with its essential components like cells, verandah, circular stupa-like structure, courtyard along with a rich crop of antiquities, like terracotta plaques, seals, sealings, inscribed potsherd, beads, iron nails and other objects of daily use.

Since the mound is under occupation, only a limited area was taken up for excavation. The excavation at the centre of the mound revealed the eastern part of the monastery. Different sizes of bricks (32x18x6 cm; 28x26x5 cm; 23x17x8 cm; 28x15x6 cm; 17x6x6 cm) and mud-mortars were used to construct the wall (w 1 m) of the monastery . The north-east and south-west corners of the monastery have been exposed. The exposed courtyard of the monastery was made of rammed-bricks with a tiled pathway (w 1 -7 m). Several post-holes along the tiled-pathway have been traced at a regular distance of 25 m, probably indicating the existence of a shed over the pathway for circumumbulation during the rainy-season. At the eastern part of the courtyard, attached to the monastic wall (verandah), a staircase (w 3 m) with three steps, has been exposed. A brick stupa (circumference 600 m and dia 2-25 m) has also been identified. The eastern verandah with rammed-floor of the monastery has also been partially uncovered. The excavation at the south-east corner of the mound revealed two monastic cells (2-60x2-60m) with corbelled niches (h 105m) in the southern wall of each cell. The height of the cell is 300 m from the floor level, with forty courses of bricks (28x24x8 cm). Originally an opening of

1 -30mx 1 -28m was provided to the partition wall in-between the cells, which was blocked subsequently. Four distinct layers of deposit have been excavated to reach the floor level of the cells.

A huge stupa-like circular structure along with a wall, adjacent to its southern part, has been exposed at the northwestern corner of the mound (pl.XXXIIA). The excavation was carried out upto the depth of 1 -50 m, within the filling debris at the centre and exposed a niche on the southern side with a blocked opening, indicative of the activities of the second phase. Few fragmentary potsherds of grey colour were recovered from the core of the structure. The existing height of the structure is about 3-5 m with the circumference of 19-63 m.

The most notable discovery of this year's excavation were seals and sealings in terracotta. Out of six, one is intact (pl.XXXIIB), which depicts a *dharmachakra,* flanked by two deers on either side on the upper part and a legend in two lines in Sanskrit below, in the characters of the ninth-tenth century reads[1] *Sri Vajradeva-Karita-Nandadirghi-Vihariya-arya-bhikshu-sam (gha).* Interestingly the monastery was named after a water-body which is still in existence as Nandadighi.

A number of terracotta plaques of varying size recovered from the collapsed debris, which were probably used to decorate the outer surfaces of the walls as noticed at Paharpur and Mainamati now in Bangladesh. Some of these plaques were found intact in good state of preservation, depicting the forms of Siva, Surya (pl.XXXIIC), Avalokitesvara, *Vidyadharas, Gandharvas,* drummer (pl.XXXIHD) and *kinnara-kinnaris,* besides sacred-manuscript on lotus (pl.XXXIIIA), warriors, human figures with a parasol (pl.XXXIIIB) and a basket (pl.XXXIIIC), devotee, boar, lion, deer, peacock, swan, etc.

Several decorated tiled-bricks (28x23x8 cm; 32x24x6 cm and 335x23x6 cm) have been found with the depiction of motifs like scroll-design, lotus-petals, diamond-shaped chains, mat and geometrical designs (pl.XXXIIID).

During the course of excavation, items of daily use like beads of semi-precious stones in different shapes and size, iron nails, bangles of iron and terracotta hopscotch, lamps, dabber, balls, figurine of elephant, an inscribed potsherd, etc. were recovered. The site also yielded a large number of pottery with shapes like dish, plate, bowl, bowl-cum-lid, knobbed-lid, spouted vessel, vase, storage-vessel, trough, miniature pot and lamp. The sherds of red and grey ware however, were recovered in plenty.

77. EXPLORATION IN DISTRICT MIDNAPUR.— In continuation of the previous year's work *{1994-95,* p.58), S. Maiti of the Calcutta Circle of the Survey, discovered the following sites of archaeological importance.

Police Station	*Village*	*Nature of remains*
Contai	Bamunia	Sea-signal post, nineteenth century
-do-	Barasubarnanagar	Ruins of a temple, nineteenth century

[1] Deciphered by Debala Mitra (Retd. D.G., ASI)

Police Station	*Village*	*Nature of remains*
Contai	Basantia	Flat-roofed brick-built square temple, eighteenth century and a small Islamic structure known as Panchapirer Masjid
-do-	Basudebberia	Exposed corner of a massive brick temple, *circa* tenth-twelfth century
-do-	Dariapur	Medieval mound, brick-built flat-roofed temple of seventeenth century; loose stone sculptures of Pala-Sena period, brick-built *atchala* type Siva temple, *circa* eighteenth century
-do-	Daulatpur	Broken sculpture of Pala-Sena period
-do-	Gopinathpur	Islamic graveyard, *circa* seventeenth century; brick-built temple, *circa* eighteenth century
-do-	Haripur	Loose stone sculpture, *circa* twelfth century
-do-	Kushbani	*Ekaratna* type brick-built Siva temple, nineteenth century
-do-	Mirzapur	Square brick-built Kali temple, nineteenth century
-do-	Pratappur	Loose broken stone sculptures, *circa* twelfth century
-do-	Rasulpur	Mazar of BarkhanSaheb,circa eighteenth century
-do-	Rupnagar	*Naga* hermitage, *circa* nineteenth century

II. EPIGRAPHY

SANSKRITIC AND DRAVIDIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. PALLAVA COPPER-PLATE INSCRIPTION, TIRUPATI, DISTRICT CHITTOOR.— This copper plate inscription, now preserved in the Tirumala Tirupati Devasthanam Museum at Tirupati in District Chittoor, was originally discovered from the village Alavakonda, Koilkuntla taluk, District Kurnool. This Prakrit charter is written in southern characters of about the fourth-fifth century AD. It belongs to the reign of the Pallava king Vishnugopa, son of Buddhavarma belonging to Bharadvaja-gotra. Dated in the first year of his reign, it registers the order of the king, issued through his officials *gama-bhojaka, amatya, arakshika, talavara,* etc., recording the grant of a village, to a *brahmana* named Sivandajja of *Kanva-gotra.* The granted village Khandanappakanura is stated to have been situated in Mimalaratta included in Chirippalikarajja.

2. PRAKRIT INSCRIPTION FROM AMARAVATI, DISTRICT GUNTUR.— This inscription, engraved on a sculptured slab now preserved in the Amaravati Museum, was originally discovered from Dharanikota in the same district. This record in Prakrit language and Brahmi characters could be on palaeographic ground assignable to *circa* second century AD. It states that it is the memorial pillar of Kanha, son of Sama, the *mahagramika* of Sa[tamala] belonging to Madhara-gotra and described as a *bamhana (brahmana),* who was a perpetual fire worshipper *(ahitagni)* proficient in performing sacrifice *(yajna-yajin),* etc.

3. REDDI INSCRIPTION, PONNAPALLI, DISTRICT GUNTUR.— This charter, now in the possession of a resident of the village Ponnapalli in District Guntur, is written in Sanskrit and Telugu languages and Telugu characters. Dated in Saka 1330 (AD 1408), it registers the gift of the village Ponnapalli situated in Divi-sima of Velanandu-vishaya to one Simganaryya, son of Pillayarya and grandson of Bhatta Bhaskara of Kasyapa-gofra by king Komati Vema of Reddi family of Kondavidu. This charter was composed by *vidyadhikari* Srinatha.

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[1] Information from : M.D. Sampath, assisted by K. M. Bhadri, M. Jayarama Sharma, C.A. Padmanabha Sastri, D.M. Nagaraju, Swaminathan, K. Karuppiah and S. Rajavelu of the Epigraphy Branch, Mysore, of the Survey.

KARNATAKA

4. PRAKRIT INSCRIPTION, KAMALAPURA, DISTRICT BELLARY.— This record, now preserved in the office of the Survey at Kamalapura, was found at the royal palace-complex at Kamalapura. This Prakrit record is written in Brahmi characters of about the second century AD. It refers to the donation made by an individual (name not clear), son of a merchant *(vaniya-puta)* belonging to Chetiya-samgha of Dhanakataka along with his family members.

NEW DELHI

5. COPPER PLATE INSCRIPTION, NEW DELHI.— This charter, written on both sides, is in Kannada language and characters of about the eighteenth century. It gives a description of*chitra-turaga* and the *chakra-krama.* There is a reference to *Samkhyaratnakosa.* The name of the ruler is referred to as Krishnadharani, probably identical with a Vodeyar ruler of Mysore.

6. COPPER PLATE INSCRIPTION, NEW DELHI.— This charter, written on both sides, is in Sanskrit language and Kannaaa characters of about the eighteenth century. The record belongs to the king Krishnaraja probably of the Vodeyar family. It contains a number of verses relating to *prasna-garbha-vriddhi-chakra* and *prasna-chakra.* There are two different types of verses in the shape of bull *(yrishabha)* and Brahma wherein the movement of horse is depicted.

7. COPPER PLATE INSCRIPTION, NEW DELHI.— This charter, engraved on both sides, except one plate, is written in Sanskrit language and Kannada characters of about the eighteenth century. It belongs to the reign period of king Krishnaraja-maharaja Kanthirava. It refers to the extracts of the verses from *Siva- Vishnu-samashtipancha-sati, Srikanthesvara-trisati* and *Sivamangalashtaka,* all in praise of Siva and Vishnu.

8. COPPER PLATE INSCRIPTION, NEW DELHI.— This single plate written on both sides, is in Sanskrit language and Kannada characters. It begins with an invocation to goddess Chamundi and furnishes the date in chronogram *rasa-dvipa-nadi-chandra* (i.e., 1776 = AD 1854) and the numeral. The regnal year quoted here is 47 *(Saka-dvip-abdhi-vatsare).* The other details of date are Lakshmi-mase, Raja-dale and Yuga-vasare. It belongs to the reign of king Krishnaraje-Vodeya and gives a graphic description of the *chitra-samkhya-sakti-chakra* consisting of 400 squares, including 144 and 64 *chaturanga-chakra.*

TAMIL NADU

9. INSCRIPTION OF SAMBUVARAYAR, VANNANGULAM, DISTRICT NORTH ARCOT.— This inscription, engraved on the south wall of a Siva temple, is written in Tamil language and characters. It belongs to the reign period of Sambuvaraya chief named Ekambaranathan Sambuvaraya. Dated in his eighteenth year (AD 1339), it refers to the revision of taxes such as *kadamai, kattigai-kanikkai, vasalviniyogam, sanduvikkiragam, nattuvari, maganmai,* etc., from the village Ammaiyappan, separated from Venrumankondanallur in Rajagambhiramalai-parru.

10. KONGU-CHOLA INSCRIPTION, KANAKKAMPUDUR, DISTRICT PERIYAR.— This inscription, engraved on a slab set up near the Bhagavati Amman Temple, is in Tamil language and characters

of the eleventh-twelfth century AD. It is dated in the 23rd year (AD 1172-73) of the reign of the Kongu-Chola king Kolottunga and records the order of the Elukarai-nattu Kammalas of Kulamanikkam *alias* Akkaisalainallur on the northern side of the division Nadalvar-nadu. It refers to the rubbing *(urakki)* of pearls *(muttu)* by the palace servants *(agambadigal)* of Kammalanallur. It also seems to mention the name of the division Nadalvar-nadu. It refers to the rubbing *(urakki)* of pearls *(muttu)* by the palace servants *(agambadigal)* of Kammalanallur. It also seems to mention the name Koduvarttattar-Mallanmattan *alias* Sola - peruntattar, probably as the protector of the grant.

11. KONGU-CHOLA INSCRIPTION, VELLTTIRUPPUR, DISTRICT PERIYAR.— This Tamil inscription, engraved on a loose stone kept in the Isvara temple, belongs to the Kongu-Chola king Virarajendra. Dated in the 25th year (AD 1231-32) of his reign, it records the grant of [201 *veli]* of land, to provide food-offerings to the deity Periyanachchiyar, after celebrating the marriage festival *(tirukkalyanam)* by Nangandi, *alias* Arpaselvi, daughter of Sadaiya-Alavandagamindar, a *vellala* of Si . . ppaiyur in Vadagarai-nadu.

12. CHOLA INSCRIPTION, ESLAM, DISTRICT SOUTH ARCOT (RAMASAMY PADAYACHIYAR).— This Tamil inscription engraved on the *jagati* portion of the *adhishthana* of the *garbhagriha* of the temple of Ramanathasvami, belongs to the reign of Chola king Rajaraja II. Dated in the 1 1lh year (AD 1157) of his reign, it refers to an order of the king issued by *tirumandiraolai* Cholendrasinga-muvendavelan recording the renewal of the grant of lands in the village Nannodera Vikkiramasolanallur, a *devadana* of the temple of Tiruviramisvaram-udaiyar at Eydar, a hamlet of Rajaraja-chaturvedi mangalam in Panaiyur-nadu in Rajaraja-valanadu, made in the 5th year (AD 1151) *asjanmakkani* to Uyyakondan Panchanadivanan of Vanchiyur. It was mentioned that necessary entries to be made in the *variyilidu* as per the register *(pottagappadi)* by the temple officials. Thereafter, the same lands were endowed during the 11th year of the king as *janmakkani* to the Vanchiyuran and his heirs after exempting the lands from taxes. This document is stated to have been attested by a number of officers.

13. PALLAVA INSCRIPTION, TIRUVAIYYARU, DISTRICT THANJAVUR.— This Tamil inscription, engraved on the south wall of the central shrine of Panchanadisvara Temple, belongs to the reign of the Pallava king, Nandivarman of Tellaru. The record can be assigned on palaeographical grounds to *circa* ninth century AD. It registers the gift often *kalanju* of gold by king Nandippottaraiyar to maintain a perpetual lamp to the deity Mahadeva of Tiruvaiyyaru. The *sabha* of Karikudi agreed to supply one *uri* of oil daily measured by *Kumaramarttandan* to the deity.

14. CHOLA INSCRIPTION, TIRUVISALUR, DISTRICT THANJAVUR.— This Tamil inscription, engraved on the *kumuda* of the *adhishthana* of the Bhikshatana Shrine in the Sivayoganathasvami Temple, belongs to the reign of the Chola king Korajakesari (identical with Aditya I). The record can be palaeographically assigned to *circa* ninth century. Dated in the 11th year (AD 881) of his reign, it records the gift of twenty-eight sheep for maintaining a lamp stand to the deity Tiruvisalur-perumanadigal of a *devadana-brahmadeya* village Amaninarayana-chaturvedimangalam. The above lamp was instituted in the *tiruppallikkattil-mandapa* raised by Keralakunjiran, for the merit of an army personnel Samanayakan Amudan Mangalavan, by his sister and servant Marandaikalam.

ARABIC AND PERSIAN INSCRIPTIONS '

KARNATAKA

1. MISCELLANEOUS INSCRIPTIONS, DISTRICT MYSORE.— Among the miscellaneous inscriptions from Mysore, an epigraph in Urdu records the name of Nawwab Sayyid Muhammad Tipu Sultan Ali Khan Bahadur Naqshbandi Qadiri, Aide-de-camp and companion of Maharaja Sahib Bahadur (i.e., Chama Rajendra Wodeyar) of Mysore, and obviously the date of his death, June 26, AD 1876. Another metrical record in Urdu speaks about the death of Mukhtarun Nisa in AH 1259 (AD 1843-44). One more epitaphic Urdu record refers to the death of Sayyida Bibi Zainabun Nisa in AD 1850.

2. INSCRIPTIONS OF WODEYARS OF MYSORE, DISTRICT MYSORE.— This Perso-Arabic inscription from Mysore, an excellent specimen of calligraphy, assigns the construction of a mosque for the army of the body-guards (fauj-i-khassa), to Krishna Raj Wodeyar Bahadur, in AH 1339 (AD 1920-21).

MADHYA PRADESH

3. MISCELLANEOUS INSCRIPTION, RAJNAGAR, DISTRICT CHHATARPUR.— This metrical inscription in Persian records the foundation of a beautiful garden by Hakim Dalmir in AH 1283/ AD 1867.

4. MISCELLANEOUS INSCRIPTION, DISTRICT GWALIOR.— This fragmentary Persian inscription in three pieces, stored in the Gwalior Fort Museum, records the foundation of some imposing structure by Amir Khwaja, for learned scholars and dignified personalities, in AH 935 (AD 1528-29).

5. MISCELLANEOUS INSCRIPTION, DISTRICT SAGAR.— This metrical Persian record from Sagar, assigns the construction of a splendid mosque, to Ghulam Qadir Khan, in AH 1287 (AD 1870-71).

MAHARASHTRA

6. EPITAPHS, DISTRICT AURANGABAD.— During the year under review a good number of epitaphs copied from Aurangabad refer to the names of some of the deceased along with the dates of their demise, e.g., Shahzada Khanam, AH 1217 (AD 1802); Shah Nawaz Khan, AH 1238 (AD 1823); Nasir Ali Khan Jamadar Naghar, AH 1257 (AD 1841); Sakina Khanam, AH 1266 (AD 1850); Jagani Khanam, AH 1266 (AD 1850) and ....Abadi Khanam, AH 1267 (AD 1850-51).

7. ASAF JAHI INSCRIPTION, DAULATABAD, DISTRICT AURANGABAD.— This one-line Persian inscription on a gun simply reads : Sarkar-i-Nawwab Mir Nizam Ali Khan Bahadur, which belongs to Mir Nizam Ali Khan Asaf Jah II, the fifth Asaf Jahi king who ruled during the period (AD 1761-1803).

8. EPITAPH, DAULATABAD, DISTRICT AURANGABAD.— This brief inscription records only a chronogram, yielding AH 1246 (AD 1830-31) for the death of Husaini Begam Sahiba.

Information from : M. I. Quddusi, assisted by S. S. Hussain, and M. Yaseen Quddusi, G. S. Khwaja, M. A. Siddiqui of the Epigraphy Branch (Nagpur) of the Survey. Two hundred and forty-seven inscriptions were copied, examined and reported during the year under review, out of which important ones are noticed here.

9. GUN INSCRIPTION, DAULATABAD, DISTRICT AURANGABAD.— This inscription (pl.XXXIVA) dated AH 1068 (AD 1657-58), records the name Muhammad Husain Arab, the manufacturer of the gun named Tup-i-Fath Jang. It further adds that (this) is the gun of Shah-i-Baland Iqbal (Tup-i-Shah-i-Baland Iqbal ast). It may be added here that Shah-i-Baland Iqbal was the title of Dara Shikoh, conferred on him by Shah Jahan felicitating the latter's 66th Lunar birthday on 3rd February, AD 1655.

10. MUGHAL INSCRIPTION, DAULATABAD, DISTRICT AURANGABAD.— This gun-record of the time of Farrukh Siyar, refers to the name of the gun as Fath Lashkar along with its charging capacity. Its date in English numeral AD 1638 hints that it had originally been a European gun, which later on, remained in the Mughal use.

11. MISCELLANEOUS INSCRIPTION, KHULDABAD, DISTRICT AURANGABAD.— This inscription points to the grave as that of Shahzada Azam Shah who having got wounded in the battle of Sarai Jaju, breathed his last. It also records the chronogram, hai Muhammad Azam, yielding AH 1119 (AD 1707) as the year of his death.

12. MISCELLANEOUS INSCRIPTION, PHULAMBRI, DISTRICT AURANGABAD.— This metrical record in Persian speaks about the death of a saintly person Shah Wali in AH 1170 (AD 1756-57). Its text was composed by Sayyid Shah Azimud Din Qadiri son of Sayyid Wali Thani.

13. EPITAPHS, KAMPTEE, DISTRICT NAGPUR.— Among the various epitaphs, one records the death of Subedar Major Muhammad Hairat? on 10th of Jumada I, AH 1248 (October 5, AD 1832), while another epitaph registers the death of his son Muhammad Qasim who expired on 1st of Jumada II, AH 1248 (October 26 AD 1832), just twenty days after the death of his father.

One more epitaph of great interest, replete with as many as eighteen chronograms, which form the entire subject matter of the inscription as well, records the death of one Shaikh Husain in AH 1308 (AD 1890-91). Each chronogram yielding AH 1308, is composed in such a way that according to the meaning, various aspects of the career of the deceased Shaikh Husain, comes to light. It provides various pieces of information about the deceased that he was born in AH 1233 (AD 1818), joined British army as a soldier in AH 1251 (AD 1835-36) and served with great efforts and merit for forty-four years. It is further recorded that because of his laudable service career, he was honoured with the titles of Sardar Bahadur and Najm-i-Hind, i.e., Star of India. He was one of the spiritual successors of Sayyid Banda Nawaz Gesu Daraz. He left Nagpur for Bhopal where he reached without any trouble, but was destined to breathe his last there. It further states that his bier was taken to Nagpur i.e., Kamptee for burial. Unfortunately, the name of the master composer who wielded great command over composing chronograms, does not occur.

14. INSCRIPTION OF THE EX-GOND RAJAS OF NAGPUR, DISTRICT NAGPUR.— This metrical record in Persian and Urdu belongs to Raja Sulaiman Shah, ex-Gond Raja of Nagpur, registering the construction of an Idgah in AH 1280 (AD 1863-64). Its text was composed by Shuhrat.

PUNJAB

15. MUGHAL INSCRIPTION, DISTRICT LUDHIANA.— It is a Persian record from Ludhiana, assigning the construction of a mosque to a humble servant Ali Hasani in AH 976 (AD 1568) during the reign of Jalalu'd Din Muhammad Akbar Badshah.

16. EPITAPH, CHHAT, DISTRICT PATIALA.— This epitaphic record in Persian, registers the date of the death of Late Muhammad Yusuf son of Salih Muhammad in AH 1011 (AD 1602).

17. EPITAPHS, SIRHIND, DISTRICT PATIALA.— An epitaph from a local tomb, records the death of Haji Muhammad in AH 1014 (AD 1606).

Three loose epitaphic records come from the locality Fatehgarh in Sirhind, from the tomb of Shaikh Ahmad Sirhindi, which appear to have been installed in recent times. These three records register both the dates of birth and death of Hadrat Imam Rabbani Mujaddid Alf Thani Shaikh Ahmad Faruqi Sirhindi and his two sons Hadrat Khwaja Muhammad Sadiq (first son) and Hadrat Khwaja Muhammad Said (second son). The father Mujaddid Alf Thani was born in AH 971/AD 1563 and passed away in AH 1034/AD 1624. The first son Khwaja Muhammad Sadiq was born in AH 1000 (AD 1592) and expired in AH 1025 (AD 1616) while the second son Muhammed Said was born in AH 1005 (AD 1596-97) and breathed his last in AH 1070 (AD 1659).

UTTAR PRADESH

18. EPITAPH, DISTRICT AGRA.— This epitaph in Urdu from Agra records the dates of birth and death of the pious figure Hadrat Sayyid Jalal Bukhari who was the son of Sayyid Muhammad Bukhari and grandson of Hadrat Sayyid Ahmad Kabir (who lies buried in Delhi). Emperor Shah Jahan had appointed him *Sadrus Sudur* (i.e., Chief Judge), bestowing the rank of 6000. He was born in AH 1003/AD 1595 and passed away in AH 1057/AD 1647. It also records that the headstone at the grave was fixed in AH 1359/AD 1940 with the efforts of Shaikh Khuda Bakhsh and Shaikh Allah Bakhsh, the brothers of Shaikh Ahmad Bakhsh, the tobacco traders of Agra.

19. EPITAPH, CHHANERA, DISTRICT BANDA.— This loose slab containing a metrical inscription in Persian speaks about the demise of a religious personality Yamini Miyan in AH 1254 (AD 1838). The metrical text was composed by one Sadiq and inscribed by Muhammad Ibrahim.

20. MUGHAL INSCRIPTION, SAHANPUR, DISTRICT BIJNOR.— This damaged record in Persian, assigns the construction of a well in a garden, to...son of Rai Singh in AH 1136 (AD 1723-24) under the supervision of Bishan Singh, the Superintendent of construction-work, during the reign of Muhammad Shah Badshah Ghazi in the regnal year 5, by incurring the expenditure of Rupees one thousand and five hundred.

21. MISCELLANEOUS INSCRIPTION, AMROHA, DISTRICT MORADABAD.— This metrical record in Persian assigns the original construction of a small mosque to Haji Ashraf 'Ali during the life-time of a versatile scholar and pious figure Sayyid Muhammad Siyadat. It further records that later on during the time of Maulana Muhammad ' Askari and his brother Muhammad Hasan. The said mosque was renovated and made spacious, at the recommendation of Dildar Husain, one of the master

architects of Lucknow. The renovation work started in AH 1284 (AD 1867-68) and completed in five years (AH 1289/AD 1872-73).

22. LODI INSCRIPTION, DISTRICT RAMPUR.— This loose fragmentary slab in six pieces from Rampur (originally from Badaun, kept as a loose slab in the house of a person at Miran Sarai), assigns the foundation of the structure of Chhah-Tal (i.e. well tank)? to Malik Nikbakht Khan Jahani, Muqti (i.e., governor) of the region (of Badaun). In the metrical part, it again records that Malik Nikbakht, a religious person laid the foundation of a mosque, a garden and a *sarai* (inn), during the reign of Sultan Sikandar in AH 898 (AD 1492-93) at an auspicious and highly scented-place for the sake of public welfare (pi. XXXIVB).

23. MISCELLANEOUS INSCRIPTIONS, DISTRICT RAMPUR.— Among the various epigraphs copied from Rampur, an inscription from a local mosque, assigns its construction to Ghulam Jilani in AH 1197 (AD 1782-83). A few epitaphs from different tombs, record the death of Mulla Faqir Akhund in AH 1206 (AD 1792), Shah Jamal in AH 1209 (AD 1794-95), Imamud Din Khan entitled Sultanji Ghalib Jahan in AH 1255 (AD 1839-40) and Shah Husain in AH 1259 (AD 1843). While a record from another local mosque, assigns its construction to one Mardan Khan in AH 1261 (AD 1845), the text having been composed by Nur.

An epitaph from the compound of Rajdwar-ki-Masjid, obviously records the death of Maulawi Ghiyathu'd Din Izzat, the composer of the lexicon Ghiyathul-Lughat, in AH 1268 (AD 1852).

24. INSCRIPTIONS OF NAWWABS OF RAMPUR, DISTRICT RAMPUR.— Of the two Persian epitaphs from Rampur, one records the death of Nawwab Ahmad Ali at the age of fifty-five in AH 1256 (AD 1840). A poet whose nom-de-plume was Karam, was the composer of the metrical text. The other is obviously the death-record of Nawwab Khuld Ashiyan (i.e., Nawwab Kalb-i-Ali Khan) who expired in AH 1304 (AD 1886-87).

III. NUMISMATICS AND TREASURE TROVE

KARNATAKA

1. SILVER COINS, CHIKODI TALUK, DISTRICT BELGAUM.— The Directorate of Archaeology and Museums, Government of Karnataka, Mysore, acquired sixty-one silver coins of East India Company and eight *varahas* belonging to the Keladi dynasty from village Nanadivadi as treasure trove.

2. VIJAYANAGARA COINS, KUDLIGI TALUK, DISTRICT BELLARY.— Twenty-six gold coins of Vijayanagara period were collected as treasure trove from village Hoskeri by the Directorate of Archaeology and Museums, Government of Karnataka, Mysore.

3. SILVER COINS, KADUR TALUK, DISTRICT CHIKMAGALUR.— Twenty silver coins of East India Company were acquired as treasure trove by the Directorate of Archaeology and Museums, Government of Karnataka, Mysore.

4. GOLD ORNAMENTS, GANJAM, DISTRICT MANDYA.— Thirty-four gold ornaments from village Ganjam, were acquired as treasure trove by the Directorate of Archaeology and Museums, Government of Karnataka, Mysore.

5. GOLD COINS, KOTE TALUK, DISTRICT MYSORE.— The Directorate of Archaeology and Museums, Government of Karnataka, Mysore, acquired through treasure trove four Mughal coins in gold from Kote.

UTTAR PRADESH

6. BRONZE IMAGE, DISTRICT AGRA.— The Agra Circle of the Survey, acquired an image of Nataraja in bronze from Hariparwat Police Station, Agra. This four-armed image (42x36 cm) dancing on an inverted lotus pedestal is shown with twenty-one fire-flames on the parasol. The deity holds a *damaru* in upper right hand while the lower right is in *abhaya-mudra.* In the upper left hand, the deity holds a flaming *khapara* and the lower left hand is in the dancing pose. This image on stylistic ground could be assignable to the nineteenth century.

7. GOLD COINS, KISHOREPUR, DISTRICT MEERUT.— Four gold coins (pl.XXXIV C-D) preserved in the custody of Station House Officer, Police Station, Hastinapur, were examined by G. N. Srivastava of the Agra Circle of the Survey. The original findspot of these coins was a quarry near the village Kishorepur. These coins were noticed by some villagers. According to the news item, published in a Hindi daily, a hoard of gold coins was found in a container by a girl of the said village out of which only four were seized by the Police. While the remaining (eighteen) coins of the same hoard were handed over to the Divisional Commissioner, Meerut, by a local MLA, which were acquired by the Agra Circle from the District Treasury.

Of the four coins, two square ones (w 11 gms each), belong to Ghiyas Shah Khalji of Malwa (AD 1468-1500) [coin type 43, pi. XI, pt. II, H. Nelson Wright, *Catalogue of the Coins in the Indian Museum, vol. //*(Oxford 1907)]. Of the other two, one circular coin (w 12-5 gms) belongs to Muhammad Bin Tughluq (AD 1325-51), while the fourth one (w 11 gms), of irregular circular shape, belongs to Samsuddin Muhammad Shah II (AD 1378-97) [coin types 230 and 260, pis. XXI and XXV, P. L. Gupta, *Coins* (New Delhi, rev. ed., 1979)].

Eighteen coins acquired by the Agra Circle of the Survey, were examined by the Epigraphy Branch (Arabic and Persian), Nagpur. These were identified as under:

Seven coins of Muhammad Bin Tughluq (AD 1325-51); one coin of Firuz Shah Tughluq (AD 1351-88); one coin of Muhammad Shah IV (AD 1389-92); one coin of Ibrahim Shah (AD 1400-40); two coins of Husain Shah (AD 1458-79); Bahmanis of Deccan, one coin of Muhammad bin Humayun Shah (AD 1463-82); four coins of Ghiyas Shah Khalji (AD 1469-1500); and one coin of Fath Shah (AD 1487-99 and AD 1505-16).

WEST BENGAL

8. METAL CAPARISONED HORSE, DISTRICT BIRBHUM.— A pair of metal caparisoned galloping horse belonging to *circa* seventeenth-eighteenth century was examined in the Bolpur Police Station by the Calcutta Circle of the Survey.

9. STONE IMAGES OF BUDDHA, CALCUTTA.— The Calcutta Circle of the Survey, examined a few stone images of Buddha and a stone sculpture of Nayika in the Office of Air Intelligence Unit, N.S.C.B. International Airport, Calcutta.

10. STONE AND METAL IMAGES, DISTRICT DARJEELING.— In the course of inspection, the Calcutta Circle of the Survey, examined a few stone images of Vishnu, Ganesa, Tara (?), and metal images of Vishnu, Radhika, etc. in the Office of the Assistant Commissioner of Customs, Naxalbari Division.

11. STONE IMAGE OF SURYA, DISTRICT MALDA.— The Calcutta Circle of the Survey, inspected the following images in stone *viz.,* one beautiful image of Surya in black basalt, belonging to the tenth-twelfth century in the Kaliachak Customs Preventive Unit, besides an eight-armed mutilated stone image, kept under the custody of Gazole Police Station.

12. STONE IMAGE OF GOPALA, DISTRICT MURSHIDABAD.— In the course of inspection, a stone image of crawling Gopala was noticed in the Baharampur Customs office, by the Calcutta Circle of the Survey.

13. STONE IMAGE OF SADYOJATA, DISTRICT NADIA.— The Calcutta Circle of the Survey, reported one black stone image of Sadyojata, belonging to the ninth-tenth century, in the Customs Office at Krishnanagar.

14. STONE IMAGES, DISTRICT NORTH DINAJPUR.— Stone images of Durga, Buddha, Sarasvati, Vishnu etc., datable between the seventh-eighth century and tenth-twelfth century, kept under the Customs office at Raiganj, were examined by the Calcutta Circle of the Survey.

15. STONE IMAGES, DISTRICT SOUTH DINAJPUR.— The Calcutta Circle of the Survey, in the course of inspection examined several stone images of Vishnu, Parvati, Surya, Ganesa, Varaha, Sarasvati, etc., assignable between *circa* tenth-twelfth and eighteenth century, in the Hill Land Customs Station. A few more images of Brahma, Vishnu, etc., datable between the seventh-eighth and the tenth-twelfth century were found in the Balurghat Customs Preventive Unit.

16. STONE IMAGES, DISTRICT SOUTH-24 PARGANAS.— Two stone images one of Vishnu and the other of Kalika were examined by the Calcutta Circle of the Survey, in the custody of Kasba Police Station.

IV. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. ANTIQUITIES AND STRUCTURES, CHANDRAGIRI FORT, DISTRICT CHITTOOR.— The Hyderabad Circle of the Survey, in the course of its survey, brought to light basal mouldings and ornamental *pranala* of the temple, a small stone *pitha;* basal mouldings of two small *mandapas* with a passage in-between, besides terracotta plumb bobs, miniature pot and a small object with stucco design, all datable to the medieval period.

2. SCULPTURES, KOTHA NANDAPALEM, DISTRICT GUNTUR.— The Hyderabad Circle of the Survey, reported the discovery of six limestone Buddhist sculptures from Kotha Nandapalem, an early historic site. These comprise panels depicting i) *mahabhinishkramana* of Prince Siddhartha, carved with wheel and *bodhi* tree; ii) *bodhi* tree, throne and a deer; iii) the scene of Buddha's birth with Brahmanas carrying the net to receive the newborn; iv) stupa flanked by devotees; v) Bodhisattva Padmapani; vi) worship of stupa. Along with these, one grinder of red stone was also reported. These objects are now preserved in the State Archaeology Museum, Guntur and one object is in the custody of Police.

3. BUDDHIST STUPAS, JUJJURU, DISTRICT KRISHNA.— The Hyderabad Circle of the Survey, reported the discovery of an important Buddhist site assignable to the early historic period, in the outskirts of Jujjuru atop a hillock, locally known as *'Itigala bodu'.* It revealed four small brick-built votive stupas and a platform.

4. MEGALITHIC AND EARLY HISTORIC ARTEFACTS, DISTRICT NELLORE.— The survey conducted by the Directorate of Archaeology and Museums, Government of Andhra Pradesh, in the submersible area of Kandaleru Reservoir Project of the district revealed megalithic and early historic artefacts at Kambalapalle and Kummarigunta.

5. SCULPTURES AND ARCHITECTURAL FRAGMENTS, SATYAVOLU, DISTRICT PRAKASAM.— The discovery of an unfinished image of seated donor, an architectural fragment of *sikhara* portion and a huge sculpture of Bhairavi, was reported by the Hyderabad Circle of the Survey. These were found while laying foundation for reconstruction of Sri Bhimalingesvara Temple.

6. TELUGU INSCRIPTION, KANDUKUR, DISTRICT PRAKASAM.— The Geological Survey of India, Southern Region, Hyderabad, reported the discovery of a rock-edict in the ruins of Kandukur Fort area (15° 13' 00"; 79° 54' 45'), west of Vikkirallapet Road (now being levelled for housing plots). The inscription is in the Telugu language and script which gives the expanse of the Kakatiya kingdom during the Saka year 1245 and the month *chaitra.* The symbols like *chakra, surya, chandra* and *sankha* are engraved on the edict.

7. BUDDHIST SETTLEMENT, PAVURALLAKONDA, DISTRICT VISHAKHAPATNAM.— The Department of Archaeology and Museums, Government of Andhra Pradesh, reported the discovery of an extensive Buddhist settlement comprising stupas and a vihara-complex at Pavurallakonda near Bheemili.

8. KAKATIYA TEMPLE REMAINS, DISTRICT WARANGAL.— Explorations in District Warangal by the Department of Archaeology and Museums, Government of Andhra Pradesh, discovered the remains of temples belonging to the Kakatiya period at Parkal and Bussapur.

ASSAM

9. NEOLITHIC TOOLS AND MEGALITHS, HAMREN, KARBI ANGLONG.— Explorations conducted by Dilip K. Medhi of the Department of Anthropology, Gauhati University, Guwahati, along with his two students brought to notice about ten different sites yielding one and a half dozen of Neoliths and as many as twenty megaliths in an area extending from the small township of Hamren, towards the Jayantia Hills upto Kanduli via Amlong and Umchera and upto Nongjirong via Rongphongbong. The list of such sites are Uzandonka, Hamren, Amlong, Omnam, Umchera, Umnar, Badong, Rongchek, Umticho and Nongjirong.

The Neoliths are categorized as edge-ground, fully ground and flaked and ground variety including the shouldered or tanged celts, triangular and quadrangular ones, besides axes, adzes and chisels.

Megaliths comprised mainly two varieties, dolmenoid menhir and dolmen.

KARNATAKA

10. SATAVAHANA COINS, SANNATI, DISTRICT GULBARGA.— The Hyderabad Circle of the Survey, discovered in the course of exploration, a few coins of Satavahana period.

KERALA

11. RING-WELLS, VELLAYANI, DISTRICT THIRUVANANTHAPURAM.— The Department of Archaeology, Government of Kerala, reported the discovery of fourteen terracotta ring-wells, datable to *circa* first century AD along with a plough (?) and a few boulders at Vellayani.

12. URN-AND CIST-BURIALS, VENJARAMOODU, DISTRICT THIRUVANANTHAPURAM.— The Department of Archaeology, Government of Kerala, in the course of excavation at Venjaramoodu, brought to notice megalithic burials *viz.,* urn-burials, cap-stone and cist burials, along with a burial jar with a conical lid. Also recovered were a few pottery, fragments of iron and bits of charcoal.

MADHYAPRADESH

13. RUINS OF MEDIEVAL JAINA TEMPLE, SAMASGARH, DISTRICT BHOPAL.— Narayan Vyas of the Bhopal Circle of the Survey, discovered a number of Jaina temple ruins and sculptures near Samasgarh.

14. ANCIENT SITES AND TEMPLE REMAINS, ALONI, DALONI, DISTRICT DAMOH.— A. K. Sinha of the Bhopal Circle of the Survey, noticed traces of a brick-wall and temple ruins near the village Aloni.

15. STRUCTURAL REMAINS, RANEH MATH, DISTRICT DAMOH.— During the debris clearance and levelling operation by the Bhopal Circle of the Survey, around the monument, it was noticed that the protected Raneh Math was just a small part of a huge complex, as there was evidence of structure on plan, and within the houses close to the Math.

16. OLD WATER SYSTEM, CHAMPA BAOLI, MANDU, DISTRICT DHAR.— During the scientific debris clearance underground, by the Bhopal Circle of the Survey, cells with stepped original entrance, floor levels, etc., were brought to notice. Besides, the walls were found provided with copper pipes, possibly to allow water to flow in with a view to cool the structure during summer months. Coloured tiles were also found fixed on the walls and floors.

17. REMAINS OF MUGHAL PERIOD, AHUKHANA, DISTRICT EAST NIMAR (KHANDWA).— During examination of the two main structures and the contour of the area in-between, A. K. Sinha of the Bhopal Circle of the Survey, observed that there was a water-channel connecting the large tank with the one in front of the arched pavilion, where the mortal remains of Mumtaz Mahal were kept for sometime, which was also confirmed by laying a trench across.

18. SCULPTURES AND PLINTH OF SIDDHANATHA TEMPLE, MANDHATA, DISTRICT EAST NIMAR (KHANDWA).— Lower mouldings of the *jagati* and a large number of sculptures and architectural fragments datable to the eleventh century were exposed by the Bhopal Circle of the Survey.

19. MEDIEVAL SCULPTURES AND ARCHITECTURAL FRAGMENTS, HANSARI, DISTRICT GUNA.— Manuel Joseph of the Bhopal Circle of the Survey, noticed numerous sculptures and architectural fragments of Pratihara period around the village Hansari.

20. SCULPTURES, PANAGARH, DISTRICT JABALPUR.— The Bhopal Circle of the Survey, reported the discovery of beautiful sculptures of female deities and architectural fragments of Kalachuri times in the village.

21. STRUCTURAL REMAINS, MADAN MAHAL, DISTRICT JABALPUR.— The Bhopal Circle of the Survey exposed close to the Madan Mahal, a number of structures belonging to Gond period. While removing the debris, a platform with courtyard and four water-tanks, two each on the west and the east, were also exposed.

22. TEMPLE REMAINS, BATESHVAR, DISTRICT MORENA.— The Bhopal Circle of the Survey, in the course of debris clearance around the main temple-complex, exposed a number of temples built during the Pratihara and Kachhapaghata periods. A large number of sculptures and architectural members were also found during the clearance.

23. MEDIEVAL SITE, PADAWALI, DISTRICT MORENA.— The Bhopal Circle of the Survey, located an early medieval site at a distance of about 500 m from the Garhi at Padawali, on way to Bateshvar, where at present, the stone quarrying is going on.

24. REMAINS OF STEPS OF TEMPLE, GARHI PADAWALI, DISTRICT MORENA.— While dismantling the part of the Garhi wall, opposite the *mandapa,* original staircase of a medieval temple was

exposed by the Bhopal Circle of the Survey. Also noticed was an inscription in the late-Kushan Brahmi characters.

25. SCULPTURES, BHOJPUR, DISTRICT RAISEN.— S. N. Shrivastava of the Bhopal Circle of the Survey, collected fragmentary sculptures and architectural member of Paramara period from the close vicinity of the main temple.

26. STONE STRUCTURES, GULGAON, DISTRICT RAISEN.— A number of stone structures and other remains were noticed in the vicinity of Gulgaon hill near Sanchi by the Bhopal Circle of the Survey.

27. PAINTED ROCK SHELTERS, KHARWAI, DISTRICT RAISEN.—Narayan Vyas of the Bhopal Circle of the Survey, during the course of his fresh survey of Kharwai hill, noticed a number of painted rock-shelters depicting hunting and war scenes. During the survey, two Buddhist stupas were also noticed, besides a few stone structures.

28. ANCIENT SCULPTURES AND REMAINS, SANCHI, DISTRICT RAISEN.— While dismantling the retaining wall, sculptural fragments, *suchi,* a railing-pillar with donatory inscriptions were found by the Bhopal Circle of the Survey.

29. PAINTED ROCK-SHELTERS, SAYER, DISTRICT RAISEN.— Near the Sayer hill, D. Dayalan of the Bhopal Circle of the Survey, discovered painted rock-shelters. The paintings, datable to the Chalcolithic period, depict groups of human figures, hunting scenes, etc. A large number of Palaeolithic tools were also found.

30. STUPAS AND SCULPTURAL REMAINS, SARAWALI TORIA, DISTRICT RAISEN.— During the course of exploration, a large number of sculptures including several stupas and other structural remains, datable to second-first century BC were found by the Bhopal Circle of the Survey. Also noticed were a few Parmara sculptures.

31. BUDDHIST REMAINS, SONARI, DISTRICT RAISEN.— A. K. Sinha of the Bhopal Circle of the Survey, discovered two large sized monasteries on the hills, adjoining the one which comprised the group of stupas near Sonari. Architecturally, both the monasteries were similar to the one located on the hill. An ancient pathway from the group of stupas down the hill was also located.

32. SCULPTURES AND INSCRIPTION, BHARHUT, DISTRICT SATNA.— The Bhopal Circle of the Survey, reported the discovery of a few fragmentary sculptures while digging pits for fixing the angle iron posts on the ground for fencing at the main stupa site. Some of these sculptures are inscribed in the Brahmi characters of second century BC.

33. MEDIEVAL SCULPTURES, GADAR MAL TEMPLE, BADOH PATHARI, DISTRICT VIDISHA.—A number of sculptures and architectural members were recovered during the levelling operation of the area, around the temple, by the Bhopal Circle of the Survey.

34. SCULPTURAL REMAINS NEAR HINDOLA TORAN, GYARASPUR, DISTRICT VIDISHA.— A. K. Sinha of the Bhopal Circle of the Survey, noticed a massive wall, most likely a part of the fortification, exposed at the east of the monument, while digging the foundation trench for constructing the

dwarf-wall all around the protected area. A few sculptures and a silver coin of Muslim period were also found.

35. PARAMARA SCULPTURES, BIJAMANDAL, VIDISHA, DISTRICT VIDISHA.— During levelling operation, a number of sculptures and architectural members were recovered by the Bhopal Circle of the Survey.

TAMIL NADU

36. EARLY HISTORICAL SITE, TIRUVERKADU, DISTRICT CHENGALPATTU-M.G.R.—An early historical habitation site was discovered on the bank of river Coovam at Tiruverkadu, a suburb of Madras city by G. Thirumoorthy of the Madras Circle of the Survey. A trial-digging here brought to light a cultural deposit datable to a time bracket of *circa* second to sixth centuries AD. Black-and-red ware, black ware, red-slipped ware, coarse red ware and sherds of local amphorae were recovered. A terracotta bust of Vishnu figure was also recovered.

UTTAR PRADESH

37. TOMB OF MUHAMMAD KHAN BANGASH, NEKPUR, DISTRICT FARRUKHABAD.— G. N. Srivastava of the Agra Circle of the Survey, under the direction of P. B. S. Sengar, brought to light the tomb of Muhammad Khan Bangash (AD 1713-43), a chieftain of the Mughals under Farrukshiyar and Muhammad Shah. The tomb of Nawab, is a stupendous monument (pl.XXXVA), dominating almost the entire landscape around it. The whole edifice stands upon a high platform of 52 mx52 m square. The tomb proper covers an area of about 35 mx35m. On plan, it consists of a big central cenotaph chamber of square shape (approximately 9-30mx9-30 m) which is further surrounded by a spacious verandah on all cardinal directions. Again on each corner there is a projected chamber, octagonal in shape. These corner chambers are raised in double storey and originally meant as corner towers. However, the dome crowning these chambers are so low that these towers appear just like an octagonal bastion. The cenotaph chamber has high arched entrance of cusped design on each cardinal direction flanked by smaller ventilator shaped in ogee arches.

The central hall above the cuboid is broken by squinch arches to support the massive dome of the tomb.

The tomb of Bibi Sahiba (Rabiya Begum), among the cluster of monuments located close to the above site, also deserves mention for its slenderness, delicate execution and ornamental *jali* screens (pl.XXXV B-C).

The tomb of Muhammad Khan Bangash has already been notified for central protection.

WEST BENGAL

38. SHOULDERED TOOL, PULUNG, DISTRICT DARJEELING.— Atul Chandra Bhowmick of the Department of Museology, Calcutta University, Calcutta, acquired a shouldered tool (19-4cmx21-4cm) which was recovered from a trench dug out by the P. W. D. Department for irrigation at Perung (26° 28'; 88° 30'), near Gulung in District Darjeeling. The tool (fig.23) was

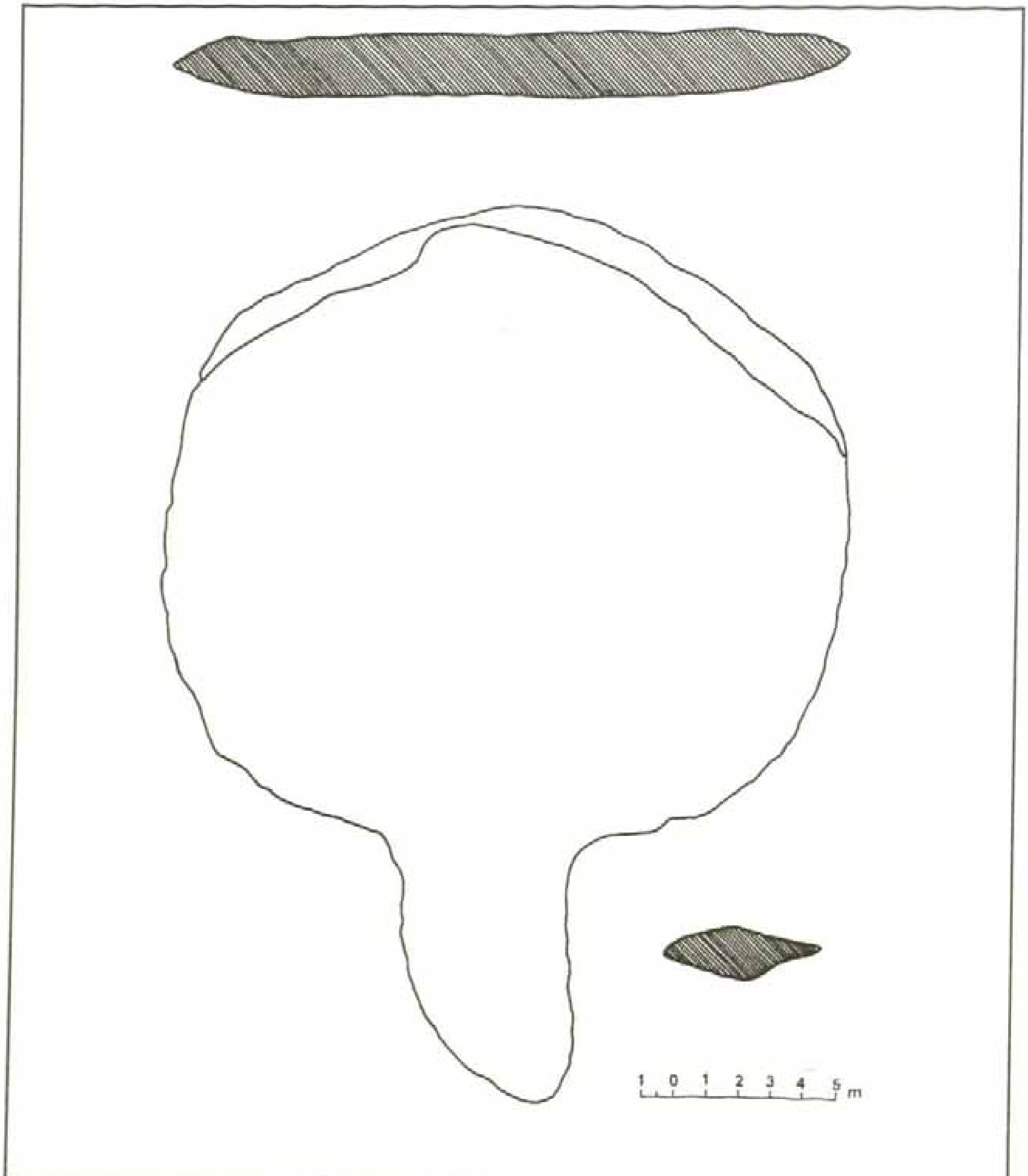


Fig. 23. *Perung : shouldered tool*

collected by Nirmalendu Bhattacharya. The artefact was worked on indurated grey sandstone, available locally. It has certain distinctiveness of its own. The tool has a round body, the dorsal and ventral surfaces, ground, flat and has a wide cutting edge, slightly converging towards its middle portion. The cutting edge shows two obliquely cut facets to make the edge slightly sharp for digging up soil. Blunted cutting edge suggested its much use. The protruding tang (7-9x51x1-5 cm) was truncated obliquely on one side, facilitating in all probability, for easy hafting angularly into a wooden handle to form a garden spade (Indian *kudal).* Its form suggested that it might well be a precursor and distant prototype of the present-day iron-spade. Some small flakes were detached at the margin indicating the use-marks. The specimen showed a less degree of grinding and polishing.

The irregular variety of shouldered tool in eastern India is exceedingly rare, known only from the Cachar and the Naga Hills. But in South-East Asia it is the predominant type in the Neolithic period. This type is fairly common in Bacsorian culture of Indo-China, in Sianian culture of Sumatra and in Malayan culture.

The shouldered tool, without digression into the question of place of origin, in all probability is a tool of Neolithic period, and its feature links it up with a large number of such tools found in Burma and Indo-China, recalling a long ancestry and close cultural contacts with the trans-border regions in the early past. i he sporadic find from the site Perung suggested that the specimen might have come from South-East Asia through Burma and permeated into the area through the over-land of Hukawang valley and the Tuza Gap routes as objects of trade, or simply a local imitation of foreign type.

V. RADIOCARBON DATES[1]

The following measurements were made on the archaeological samples[2] during the period under review. All the dates based on 5730± 40 years half-life value of radiocarbon. The year 1950 is the year to convert these dates into AD/BC scale. All the dates are uncorrected for $^{14}C/^{12}C$ variation.

GUJARAT

1. ROJDI, DISTRICT RAJKOT

PRL-1870. Late Harappan Charcoal sample from Trench 47 P Layer 3, Locus NE Sender's sample No. 002	3570± 170

RAJASTHAN

2. BALATHAL, DISTRICT UDAIPUR

i. PRL-1925.Chalcolithic Charcoal sample from HX2, Layer 15, Locus NE depth 3-80 m Sender's sample No. 02	3810±170
ii. PRL-1928.Chalcolithic Charcoal sample from HX2, Layer 18, Locus SW, depth 4-68 m Sender's sample No. 05	4550 ±180
iii. PRL-1933.Chalcolithic Charcoal sample from Trench OE	5770 ±100

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[1] Contrited by Sheela Kusumgar and M.G. Yadava of the Physical Research Laboratory, Ahmedabad. Further details of the dated samples can be obtained from the excavors.

[2] Samples submitted ; 1, The Department of Archaeology, Government of Gujarat, Ahmedabad; 2 and 4, Decan College, Post-graduate and Research Institute, Pune; 3, Excavation Branch II, Purana Qila, New Delhi, of the Survey; 5, Physical Research Laborartory, Ahmedabad; 6, Department of Archaeology and Anthropology, University of Ibadan, Nigeria.

Layer 23, Locus SW, depth 4-98 m
Sender's sample No. 10

iv. PRL-1937. Chalcolithic — 3980 ± 90
Charcoal from Trench CG2, Layer 16, Locus SE depth 2-51 m Sender's sample No. 14

3. DAMDER KHERA, DISTRICT DHOLPUR
PRL-1824. Black and Red ware — 2440 ± 160
Charcoal from Trench A. 1, Qd 4 Layer 2, depth 0-5 m Sender's sample No. 2

TAMIL NADU

4. PAPPINAYAKKANPATTI, DISTRICT MADURAI
PRL-1965. Megalithic — 2040 ±150
Charcoal from Trench PPT.1.94 depth 0-5 m

UTTAR PRADESH

5. BAGWALIPOKHAR, DISTRICT ALMORA
PRL-1706. Historical — 14,040 ± 160
Charcoal associated with pottery and undressed stones, depth 0-6 to 0-8 m Sender's sample No. 119

SAMPLES FROM ABROAD

NIGERIA

6. OBAGBO SETTLEMENT SITE, DISTRICT ISIN EAST

i. PRL-1862. Historical — Modern
Charcoal from Square A' Extension depth 0-35 m Sender's sample No. 2

ii. PRL-1864. Historical — Modern
Charcoal from Square A' Extension Layer 3, depth 0-6 m Sender's sample No. 4

iii. PRL-1867. Historical — 640 ±140
Charcoal from Furnace 2 depth 06 m Sender's sample No. 7

VI. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS[1]

The report incorporates the result of studies carried out at Birbal Sahni Institute of Palaeobotany, Lucknow, on the botanical remains recovered from Sanghol in Punjab, a prominent excavated site in the Archaeological Atlas of India and Kudan in Nepal.

PUNJAB

1. SANGHOL (30° 47” N; 76° 23” E), DISTRICT LUDHIANA-- A large number of seeds and fruits of wild and weed species from the deposits of Kushan culture (AD 100-300) are of particular significance, not only to the actual determination but for acquiring the state of soil conditions and a general picture of ground vegetation around the settlement at ancient Sanghol. Many plants might have arrived through the activity of settlers, albeit not necessarily intentionally. Some species occur obtrusively in the cultivated fields. Their presence in association of crop remains, may be taken as a reliable evidence of the state of fields. Quite a good number of them come from fallow or grasslands or waste places. They may be expected to turn up even without human interference, wherever the settlers and their domesticated animals left their droppings and other traces. Details are lacking about how did they come in the settlement. Man in ancient times was more dependent on a number of wild plants for food, medicine, ceremonial and other requirements. Based on the economic models of present-day tribal people and rural farming communities, some significant conclusions can be drawn regarding the exploitation of wild plants for varied uses in the past.

The seed (pl.XXXVI) and fruit remains include Indigofera sp., I. *enneaphylla*, *Fimbristylis dichotoma, Dactyloctenium aegyptium, Andropogon sp., Panicum sp., Rumex dentatus, Elaeogharis sp,m Echinochloa crus-galli, Scipus sp., Scleria sp., Cyperus sp., Commelina benghalensis, Vicia hirsute, V. sativa, Polygonum cf. barbatum, Polygonum lanigerum, Polygonum plebeium, Trianthema triguetra, Trigonella occulta, Sida sp., Chenopodium album, Datura sp., Solanum sp., Argemone mexicana and Eleusine Indica.*

Mixed in these remains are the seeds of heena or mehandi (*Lawsonis inermis),* which deserve special mention. These seeds (pl.XXXVI, 1) with the wood charcoal (pl.XXXVII) suggest that henna was culticated for its leaves which, on being powdered and made into a paste give dye for colouring hand-palm and nails. One may presume that ladies at ancient Sanghol might be using henna for embellishment.

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[1] Contributed by K.S. Saraswat, Chanchala Srivastava and Anil Kumar Singh Pokharia of the Birbal Sahni Institute of Palaeobotany, 53 University Road, Lucknow.

Kushans exploited the wood of a number of wild trees and shrubs for fuel and other requirements. Twenty-two taxa have been identified through the anatomical studies of wood charcoals (pi.XXXVII). These include babul *{Acacia* cf. *nilotica),* siras *(Albizia lebbeck),* bamboo *(Bambusa* sp.), palash *(Butea monosperma),* heens or jhiri *(cappahs sepiaria),* aak or madar *(Calotropis procera),* deodar *(Cedrus deodara),* limon *{Citrus* cf. *limon),* dhatura *{Datura* sp.), anwla *{Emblica officinalis),* Kaith *{Feronia limonia),* gular *{Ficus glomerata),* pipal *{Ficus religiosa),* dhaura *{Lager stroemia parviflora),* henna *{Lawsonia inermis),* Keim *{Mitragyna parvifolia),* Khejri *{Prosopis spicigera),* shahtoot *{Morus alba),* Castor *{Ricinus communis),* teak *{Tectona grandis),* grape *{Vitis vinifera)* and ber *{Ziziphus* sp.).

Finds of some wood charcoals are of particular significance. Wood charcoal of *Ricinus communis* suggests that castor plants were grown for their oleiferous seeds. Quality wood of deodar *{Cedrus deodara)* was exploited from Himalayan forests. Similarly teak-wood *{Tectona grandis)* was obtained from the deciduous forests in Central India. Further shahtoot *{Morus alba),* grape *(Vitis vinifera),* lemon *(Citrus* cf. limon and anwla *(Emblica officinalis)* were some of the common fruits, enjoyed by the settlers at Sanghol. Their charcoal remains have furnished the evidence of some gardening activities in the region during Kushan times.

SAMPLES FROM ABROAD

NEPAL

2. KUDAN (27° N ; 82° E), DISTRICT TAULIHAWA.— The anatomical studies of wood charcoal pieces from the deposits of NBPW culture *(circa* 600-200 BC), were carried out to determine their specific identification. A good number of charcoal pieces were in poor state of preservation. The study revealed that the finds of timbers belong to the families like Mimosaceae, Fabaceae, Dipterocarpaceae, Combretaceae and Verbenaceae. Specific identification could be determined with certainty of *Shorea robusta, Terminalia tomentosa* and *Adina cordifolia. Shorea robusta* charcoals were of predominant occurrence in the collection. These timbers indicate their exploitation from the surrounding mixed-deciduous forest, in the region.

VII. MUSEUMS

1. Taj Museum, Taj Mahal, Agra.— During the period under review, worn-out carpet, electrical wiring of the museum galleries, including the damaged glasses of the showcases have been replaced. Old labels have been changed and new cultural texts have also been provided. For circulation of air inside the galleries, pedestal fans have been provided.

2. Government Museum, Ajmer.— During the year under review, following activities were attended to for museum development. Fifteen show cases were repaired, their exhibits were cleaned, classified and provided with the new woolen cloth for proper maintenance of the antiquities. Two-ceiling fans were provided to the museum galleries during the year. Walls in the galleries were provided with colour wash. The descriptive labels of sculptures were provided and made more attractive and educative. Old electric service line of the museum was changed during the year. One vaccum cleaner (dust buster) was purchased for proper maintenance. In addition, arrangements were made to provide sufficient light to the galleries besides attending to the other facilities for proper maintenance of the museum.

3. Bharat Kala Bhavan, Banaras.— During the period under review, the museum acquired one brass image of Rama, datable to the eighteenth century, one set of ear ornament and two items in the textile section through purchase.

4. Archaeological Museum, Bodhgaya.—The garden inside the museum has been maintained properly.

5. Archaeological Museum, Singhpur Palace, Chanderi.— During the year under review, the museum collection was enriched by acquiring thirty stone sculptures of Pratihara period (tenth-twelfth century).

The museum galleries are being organized as all the six galleries are ready for display. In Gallery Nos. 1 and 2 wooden pedestals have been provided for display of antiquities. The galleries were also provided with false walls and ceilings besides making arrangement for track-channel lights.

With a view to disseminating the knowledge of art, culture and the National Heritage among the local semi-literate young visitors, the museum organized an open debate competition on the occasion of Hindi Raj Bhasha week.

The museum also enriched the library by purchasing some new publications on history, art and archaeology.

6. MAHARAJADHIRAJA LAKSHMISHVARA SINGH MUSEUM, DARBHANGA.— The museum collected during the year, objects of wood, ivory and *palki* besides a throne.

7. ASSAM STATE MUSEUM, GUWAHATI.— During the year under review, a hoard of copper coins of the pre-Ahom period was collected by the Directorate of Archaeology and Museums, Government of Assam.

The Directorate also celebrated the fifty-sixth Foundation Day of State Museum on 21 st April, 1995. On this occasion a symposium was held on *"Oitijhyamandita Asamar Than Samuhar Sangrakshan "* under the Directorship of Nirmalprabha Bardoloi.

During the period under review the cultural objects of Deuries, a major tribe of the Brahmaputra valley, were collected for the Ethnographic gallery of the Museum.

8. ARCHAEOLOGICAL MUSEUM, GWALIOR.— Broken glass of arches and windows have been replaced in the museum galleries and jail building. Labelling, developing and maintenance of open ground in front of the museum building have been done for laying out a garden. Painting with acrylic emulsion and acrylic distemper on the walls, ceiling, doors and windows of the buildings has been done. The damaged wood and ply of the pedestals have also been replaced. Labels on the antiquities have been covered with perspex sheet.

Considerable progress has been achieved in accessioning of antiquities and photo documentation.

9. SALAR JUNG MUSEUM, HYDERABAD.—During the year under review, the museum has been very active in implementing a wide variety of art/cultural programmes for the benefit of public and students.

A special exhibition was inaugurated at the museum premises on September 19,1995 to exhibit the rare collection of drawings and engravings, executed by the famous British artist, like Thomas Daniell, William Daniell, Henry Salt, James Wales, James Havell, Hill and J. B. Fraser (AD 1795-1810), which were acquired by Salar Jung III. These engravings are epitome of precision and exhibit awe and great taste of the Nizams. Among these engravings, the monuments listed under the World Heritage category *viz.,* Caves of Ellora, Ajanta and Karle (pl.XXXVIII A), Mahabalipuram, Brihadisvara Temple at Thanjavur, medieval monuments of Delhi and Agra, Nayaka Palace at Madurai (pl.XXXVIII B), are some of the noteworthy examples. Nearly hundred such prints of famous engravers were exhibited, besides displaying the write up on the treasures of Salar Jung collection. This exhibition was open to public till October 31,1995. In view of the popularity and importance, the very same theme was put up on view in the Mobile Van and taken to the educational institutions and public places within the twin cities from November 15, 1995 to January 16,1996.

The Salar Jung Museum in collaboration with Indian Museum, Calcutta, organized an Inter-State Exhibition at Calcutta, for the first time, on rare jade collection (from October 31 to November 10,1995). The Salar Jung Museum has a rich collection of Mughal jades, in particular Aurangzeb's dagger with jade handle; Shahjahan's archery ring (pl.XXXIII C); a carved jade-screen with portraits of the three Salar Jungs.

An exhibition on paintings of school children was also held between December 17, 1995 and January 16, 1996 on the eve of Museum Formation Day. The museum arranged an eye catching exhibition based on the paintings drawn by handicapped students from different institutions of the twin cities. Total sixty-eight children from four institutions of disabled children participated in the painting competition. The theme of the painting related to the subjects like (1) festival of choice; (2) landscape portraits; (3) cross-roads and reflections on the museum. The paintings and the colours used in depicting the themes show maturity, their special interest and talent besides the grasp on contemporary patterns of life and nature. The same was later put up on show in the Mobile Van, taken to various schools and public places from February 7 to May 16, 1996.

Coinciding with one hundred and sixth birthday celebration of Late Pandit Jawaharlal Nehru, the first Prime Minister of India, Children's week was observed from November 14 to 20, 1995. Children upto the age of twelve years were allowed free entry into the Museum.

In all nine thousand four hundred and ninety-two students and six hundred and twenty teachers from two hundred and sixty-three educational institutions visited the Museum. Essay writing and Elocution competitions in four languages (Hindi, English, Telegu and Urdu), both for school and college students were conducted. This year emphasis was more on the participation of disabled children in painting competition. Prizes and certificates were distributed to the winners on December 16, 1995 coinciding with the Museum Formation Day.

The museum week was also observed from January 8 to 14,1996. A series of special lectures (three) were arranged on the following topics, Setting up of a Gallery on Tribal Art and Culture of Andhra, by K. Mohan Rao, January 8,1996; Environmental Pollution and Care of Art Objects by S. Subbaraman, January 9, 1996 and Organization and Set-up of museums in Andhra Pradesh by V. V. Krishna Sastry on January 10, 1996.

Rangoli competition, exclusively for ladies, was conducted coinciding with the Pongal festival on January 14, 1996 in which seventy-one ladies of different groups participated.

To mark the special occasion of hundred and tenth anniversary of Salar Jung III from 5 to II March, 1996 a photo exhibition, 'Landmark in the Set-up of Salar Jung Museum' was set up by the museum. The events connected with the setting up of the Museum since its inception on December 16, 1951 were highlighted . In this rare exhibition, the old galleries in Dewan Deodi; handing over of the Museum to the Government of India (1958); The Stone laying ceremony by Pandit Jawahar Lai Nehru (1963); Silver Jubilee celebration of the Museum (1976); Birth Centenary of Salar Jung III (1986) and reorganization of the Museum galleries on modern scientific lines, have been displayed. As a part of these celebrations, two Memorial lectures : Rare collections on astronomy in the Salar Jung Museum by S. M. Razullah Ansari (6-3-1996) and Indian Miniature Paintings by S. V. Gorakshakar (7-3-1996) were delivered.

Besides a seminar on Historical Monuments and Museums at Hyderabad was held in the Museum on March 10, 1996.

The following exhibitions were arranged in the Mobile Van. The theme of these exhibitions were World Heritage monuments of India, select monuments of Andhra Pradesh, game of chess (from April 18 to October 1995), engravings of Indian monuments by English artists from November 15, 1995 to January 16, 1996 and colours from the handicapped. The exhibitions were sent to various places within the city and neighbouring villages in Districts Ranga Reddy and Medak.

The museum also organized an exhibition of paintings done by the school children on February 7,1996. This exhibition covered two hundred and fifty-seven educational institutions, besides Nehru Zoological Park, Public Garden, and neighbouring villages. Students over two lakhs availed the facility besides a large number of public. In view of its popularity and response from the visitors, the Mobile Van was taken to various public places and villages for two months.

10. GOVERNMENT MUSEUM, JHANSI.— During the period, the museum acquired five hundred and seven copper coins, six hundred and ninety-one silver and twenty-one gold coins, four stone sculptures, five terracotta figurines and one bronze besides eleven other art objects.

11. ARCHAEOLOGICAL MUSEUM, KALIBANGAN.— During the period under review, the Gallery No. 1 was provided with wall showcases, false walls, track-lights and tubelights besides painting of false ceiling and wooden pelmet in Gallery No. 2.

12. ARCHAEOLOGICAL MUSEUM, KHAJURAHO.— Vinyl flooring has been provided in the Miscellaneous and Jaina Gallery of the Museum along with provision of exhaust fans. Besides painting of the galleries photo-documentation of antiquities has also been completed.

13. ARCHAEOLOGICAL MUSEUM, KONARAK.— Damaged electrical outfit in the museum has been replaced and the affected areas were replastered.

14. STATE MUSEUM, LUCKNOW.— The museum acquired through purchase or gift the following objects, e.g., stone sculpture of a four-armed Vaishnavi, seated on *agaruda (circa* twelfth century); *eka-mukhi Siva-linga* carved *With jatajuta, karna-kundala* and *ekavali (circa* seventh century) and an image of Harihara *(circa* twelfth century), received from the District Magistrate, Sitapur; silver coins of Awadh rulers which belong to Gazi-ud-ddin Haider, Nasirud-ddin Haider, Amjad Ali Shah, Wajid-Ali-Shah and Native states; alloy medals of British rulers; gold plaque of Karttikeya *(circa* first century AD), found from Hulaskhera, Mohanlal Ganj tehsil, Lucknow; three miniature paintings in Persian style depicting birds, animals, etc., seven manuscript leaves from *Panchatantra* depicting the story of Rama; *khukari* with ivory handle and decorated with silver designs besides half gold mohars of Edward VII (AD 1909), Queen Victoria (AD 1860, 1887 and 1894) and a lead coin of Satavahana period.

15. GOVERNMENT MUSEUM, MADRAS.— The museum acquired through treasure trove, the following objects : one crawling Krishna from Sirkali and a Devi from Vadamazhai; three icons of Durga, Ganesa, village deity, snake and deer from Arupathi; two Devi images from Kidangal, District Nagai Quaid-e-Milleth; two images of Vishnu, Sri Devi, Bhu Devi and bala-Krishna from Kuttakkudi, Kallakurichi taluk, District South Arcot; Vallalur and an icon of Chandrasekhara from Kumbakonam;

sculptures in gold, waist-band, fragmentary silver bangles including two metal containers from village Thamma Reddy Palayam, Kangayam taluk and two gold items from village Punkar, Sadhyamangalam taluk, District Periyar; sixteen items of gold consisting of ear-rings, rings, beads, a bangle and a chain from the Judicial Magistrate, Nagercoil, District Kanyakumari; a crawling Krishna, two metal bangles from village Seemapuram, Ponneri taluk, District Chengai M.G.R; six carnelian beads from village Ponnesvara mut, Krishnagiri taluk, District Dharmapuri. In addition to the above items, the museum also collected golden crown as a gift from J. K. Joy, an Industrialist of Anna Nagar, Madras.

The Numismatic section of the Museum, also acquired through treasure trove the following coins: thirty-seven south Indian *phanams* from Perambalur taluk, District Tiruchi; five hundred thirty-three*phanams* from Tharapuram taluk, District Periyar; five hundred and seventy-nine Raja coins of copper from Valangaiman taluk, District Thanjavur; twenty-seven south Indian *phanams* from Tirupur taluk, District North Arcot Ambedkar; forty-four (Indo-British) Victoria coins in silver from Madurai and fifty-seven (Indo-British) coins of Edward VII, George V and Queen Victoria in silver from Utangatai taluk, District Dharmapuri.

16. GOVERNMENT MUSEUM, MATHURA.— During the year under review, thirteen hundred and seven objects were acquired and duly accessioned which comprise sixteen stone sculptures, eight terracotta objects, two gold coins, two hundred and fifty silver coins, one thousand and twenty-six copper coins and five bronzes.

Among the bronze sculptures, a standing image (Ace. no. 95.13.5) of two-armed Rama (pl.XXXIXA) in *suchi* pose on a high lotus pedestal, deserves special mention. The deity (23x8-3 cm) decked with armlet and girdle, belongs to the Chola school *(circa* twelfth century). The icon was presented by Dinkaur, Sikandrabad, Bulandshahr Police. Another two-armed image of Sita (22-5x8-3 cm) in bronze is shown with ear-rings, necklace, girdle, armlet, bangles and anklets. The goddess with prominent breasts, standing on a high lotus pedestal, holds a lotus in her right hand while her left forehand is broken.

A sculpture depicting Kubera and Hariti (Ace. no. 19.16. 4) seated on a pedestal is also an important addition (pl.XXXIX B). The forehead, portion of right knee and pot-belly of Kubera are badly damaged, the right hand of the deity raised up and the left holds a cup. Hariti has been shown wearing necklace, carrying in her left hand a headless child with her right hand raised up and the left holds a cup. This image, acquired from Shitala Ghati, Mathura, belongs to the Kushan period (first century AD).

Another object (Ace. no. 95.18.4) acquired by the museum from Mahou, Aligarh, represents an inscribed slab of Kushan period, containing a single line inscription. The slab (42x19 cm) is carved with a complete stupa, surrounded by a railing and approached by a flight of steps. The stupa has been depicted with an ornamental gateway *{torana)* and two images on each side (pl.XXXIX C).

17. HAZARDUARI PALACE MUSEUM, MURSHIDABAD.— During the period under review, the second Armoury gallery has been thrown open to the visitors after completing the display, an iron grill-

gate has been fixed as a security measure. Painting of walls of verandah of the ground floor has been completed with suitable colour and two vintage cars have been displayed there after due repairing. All the doors, windows and iron grills inside the museum galleries have been painted.

Iron grills and collapsible gates have been fitted in the Western Drawing Rooms, the new gallery and the Library Room of this museum. Nine chandelliers have also been displayed in the Western Drawing Room.

Electrification of the new booking counter of this museum has been completed in all respects.

The old wooden frames of the paintings of different portraits and landscapes displayed in the galleries have been painted with golden colour for a fresh look as also to save them from further deterioration.

Preparation of labels and charts has been completed.

18. ARCHAEOLOGICAL MUSEUM, NALANDA.— The electrical wiring has been renewed with concealed wiring and a collapsible gate has been installed at the main gate of the museum building.

19. ARCHAEOLOGICAL MUSEUM, PURANA QILA, DELHI.— In order to complete the organization of galleries in the museum, the preparations of false walls, ceiling and electrical wiring have been done.

20. ARCHAEOLOGICAL MUSEUM, RATNAGIRI.— During the year under review, the display in Gallery No. 3 and half of the work in Gallery No. 4 have been completed. Minor objects including Buddha in *bhumisparsa mudra,* Avalokitesvara, *dhyani* Buddha, flying Gandharvas, inscribed slabs, Vaishnavi, Ganesa, etc., have been displayed in nine showcases and certain other sculptures including Ushnishavijaya, Marichi depicted on votive stupas have been displayed on brackets.

The museum galleries were painted, corridor was covered with coir-matting and the flower-pots were placed at the entrance.

21. ARCHAEOLOGICAL MUSEUM, RED FORT, DELHI.— During the period under review, photo documentation of coins lying in reserve collection in the museum, has been taken up and considerable progress was achieved. Replacement of damaged plywood and cloth in the showcases of the entrance gallery, providing iron grill in the windows of the strong room for safety, fixing stainless railing in the galleries, proper lighting arrangement in the showcases have also been done. Bahadur Shah Zafar gallery was also rearranged.

22. INDIAN WAR MEMORIAL MUSEUM, RED FORT, DELHI.— In Gallery Nos. 5 and 6, broken glass of the showcases along with the old labels of the objects have been replaced. To improve air circulation in the galleries, wall mounted fans were provided.

23. SWATANTRATA SANGRAMA SANGRAHALAYA MUSEUM, RED FORT, DELHI.— On the auspicious occasion of the one hundred and twenty-fifth birth anniversary of Mahatma Gandhi, this museum has been dedicated to the nation by the Hon'ble Prime Minister of India on the 2nd October, 1995

in the sacred memory of the countless freedom fighters who sacrificed their lives for the sake of the mother land.

In one of the barracks in Red Fort, taken over by the Survey, from the Army authorities, a Freedom Fighter's Memorial Museum has been set up in which glimpses of India's freedom struggle from 1857 to 1947 have been depicted through photographs, paintings, period lithographs and objects such as guns, pistols, swords, shields, rank badges, medals, flags, dioramas, panels in relief, busts, bronze sculptures, etc. The exhibited antiquities and art objects have been acquired through purchase or loan.

24. ARCHAEOLOGICAL MUSEUM, ROPAR.— The museum organized an exhibition of pottery and photographs of Ropar and other adjoining sites on the occasion of 'World Heritage Week', in collaboration with the Chandigarh Circle of the Survey.

25. ARCHAEOLOGICAL MUSEUM, SANCHI.— Wooden pedestals in the museum were prepared for heavy images for replacing the brackets along with repair of old and worn-out pedestals. Rewiring of loose wires has been done and the garden inside the museum has been replaced with new ones with perspex sheet covers.

26. ARCHAEOLOGICAL MUSEUM, SARNATH.— Gallery No. 4 of the Archaeological Museum, Sarnath, has been completely reorganized as Brahmanical gallery. The sculptures of Hindu pantheon such as Siva, Vishnu, Ganesa, Karttikeya, Parvati, Lakshmi and *navagrahas* have been displayed in this gallery. In the same manner Gallery No. 1 has also been reorganized. During the period under review, old dead plaster on the walls and ceiling was removed and replastered. Concealed electric wiring has also been done.

Four collapsible iron gates have been provided one in each gallery in order to provide proper security to every gallery.

For the visitors, a new water tank with brass taps has been installed.

27. ARCHAEOLOGICAL MUSEUM, VAISHALI.— The galleries in the museum were provided with anti-termite treatment. The garden in front of the museum building has been maintained along with anti-termite treatment in the galleries.

VIII. ARCHITECTURAL SURVEY

TEMPLE SURVEY.— The Temple Survey Project (Northern Region), under P.K. Trivedi assisted by Lakhan Kumar Bhagchandani, Alhad Vyas, R.V. Chalam and L.P. Dhaker, undertook the survey of the temples of Guhilas of Mewar in Rajasthan. The temples at Ahar in Udaipur city and Iswal in District Udaipur were surveyed. Ahar is also famous as an excavated site and for the royal cenotaphs of the erstwhile rulers of Udaipur. The Siva temple, Ahar, built of marble, is a small but neatly dressed edifice. Facing west, it consists of a *nirandhara pancharatha garbhagriha, antarala* and a lately added *mandapa* of brick-work, the original superstructure being also replaced. Raised on *kharasila* its pair of plain *bhittas* are pierced through a *makara-pranala* on the north. The flattened head *of makara-pranala* with protruding tongue resembles more a *grasamukha* than a crocodile. Above lies a thin *kapotika* punctuated with *chandrasalikas* flanking *ardharatna* motif on the *bhadras* and projections *(rathas)* of the vestibule. The boldly chiselled heavy *vedibandha* is composed of *khura, kumbha* carved with pointed half-diamonds, *kalasa, antarapatra* and *kapotapali* mouldings. The *kapotapali* exhibits a single *chandrasalika* with flanged vegetal ends on the *karnas,* half-*chandrasalikas* on the *pratirathas,* while the *bhadras,* are carved with a triangular diamond, flanked by *half-chandrasalikas* (pl.XL A). The *jangha* is relieved with three cardinal niches harbouring seated images of four-armed Siva (pl.XL B) on the sanctum and niches on the offsets of the vestibule. Each niche rests on a plain *urdhvachippika* with a *gagaraka* strip below and is crowned by a triangular pediment designed with incised *chaitya-mesh* surmounted by a rectangular vegetal capital The northern and southern niches of the vestibule display ten-armed Chamunda in dancing pose and two-armed seated Lakulisa respectively. The top of the *jangha* is surmounted by *grasapatti* decorated with beads followed by a *dvistara-varandika,* plain deep recess and *padma.* The interior of the square *garbhagriha* reveals traces of *gauripatta* on its floor. Its *samatala-vitana* carved with a lotus-medallion shows two whorls of petals around seed-pod. The threshold *(udumbara)* shows an angular *mandaraka* bedecked with a pair of *hamsas* encircled by lotus stalk and flanked by circular medallions, as in the Mira Temple, Ahar and seated *nidhiputras* carrying purses. The *trisakha* doorframe shows bevelled *patrasakha,* middle band carved with lotus petals and the outermost branch incised with vegetal scrolls. The *lalatabimba* is represented by four-armed Ganesa seated in *sukhasana* while the architrave *(uttaranga)* shows nine planets, each seated on a circular cushion. On the floor of the vestibule is preserved a *chandrasila* fringed by conches. The ceiling of the vestibule has perished but the southern inner *kapili* wall has retained an empty pedimented niche. The inner walls of the vestibule show *bhittistambhas* surmounted by plain *bharanis,* carrying *kumara-brackets* sharing the load of an architrave *(patta).* Stylistically, the edifice may be attributed to the first quarter of *circa* eleventh century.

The shrine dedicated to the goddess Mahishamardini at Ahar is situated in front of the Siva Temple and faces east. Locally called Durga Temple, it has been thickly coated with lime and preserves *apancharatha garbhagriha* and *antarala,* the remaining portion including superstructure being later work. The *angas* have been divided into further divisions. The structure is raised on a low *pitha* showing buried *bhitta, jadyakumbha, karti, kapotika* followed by projected *grasapatti,* whereas the *vedibandha* resolves into *khuras* punctuated with *udgama* dormer, tall *kumbha* with broad *ardharatna,* a deep recess, *kalasa, kapotapali* and *manchika.* The *jangha* divided by a *madhya-bandha* of lion-head frieze bears pedimented empty cardinal *bhadra-khattakas,* surmounted by a lion-head frieze, a recess decorated with diamonds, *bharani, varandika,* recess and a ribbed awning (pl.XLI). The square sanctum houses a moulded *pithika* over which is kept a marble image of Mahishamardini of late period. The flat ceiling of the sanctum is carved with full-blown medallion. The shrine may be assigned to *circa* twelfth century.

The Vishnu Temple, Ahar, is popularly known as Mira Temple. Facing west, it has preserved a *nirandhara garbhagriha,* and an *antarala* preceded by a lately added porch. The *garbhagriha* exhibits three *angas viz., bhadra, pratiratha* and *karna.* The *bhadra* offsets show *upabhadras* flanking the *subhadras,* while the *pratirathas* and *karnas* are divisible into three divisions all continuing upto the *sikhara-base (prahara)* (pl.XLII). In elevation the edifice shows a low *pitha* composed *of bhitta, jadyakumbha* punctuated with *thakarikas,* plain deep recess *(antarapatra),* overlain by a projected *grasapatti.* The *vedibandha* shows plain *khura,* tall *kumbha* carved with looped lotus buds, small niches containing figurines of Lakshmi-Narayana on the *subhadras,* bejewelled *kalasa, antarapatra* bedecked with *kunjaraksha* motif, a broad course *of kapotapali,* a narrrow course *of kapotapali* with pendant *lumas* overlain by *narathara* frieze showing frgurines of *maladharas, vamsivadaka,* couples, Narasimha being worshipped by devotees, reclining Vishnu, ascetics, *kinnaras,* religious discourses, a man lifting the stones, a lady dressing hair of a bearded man and ironsmiths etc. The profusely decorated *jangha* exhibits seated images of Brahma and Savitri (N), Lakshmi-Narayana (E), Uma-Mahesvara (S) as *bhadradevas* and *apsarases* and *vyala* figures. Notably the *jangha* is topped by a *narathara* frieze followed by a *dvistara varandika* with hanging *gagaraka* strip framing a deep recess carved with *kunjaraksha* design, again a recess marked with diamonds, and *sikhara-base (prahara).* Regarding the interior, the sanctum is entered through a doorsill displaying a circular *mandaraka,* carved with lotus scroll and flanked by boldly worked *kirttimukhas.* In front lies a moon-stone flanked by a conch. The flat ceiling of the sanctum is decorated with a medallion. The temple was originally built in *circa* AD 980. The superstructure is however, of later period.

The Vishnu Temple, Iswal, is located about 21 km from Udaipur on the road leading to Ranakpur. The *panchayatana* temple-complex consists of the temple proper surrounded by four corner shrines. The easterly oriented main temple *(mulaprasada)* includes a *nirandharapancharatha garbhagriha,* an *antarala, sabha-mandapa* with lateral transepts *(parsvalindas)* and *mukha-mandapa* (pl.XLIII A). The square sanctum houses a large image of four-armed Vishnu, carrying *gada* and *chakra* in the upper hands, the lower ones being mutilated. On the border of this image are portrayed ten incarnations of lord Vishnu. The flat ceiling carved with a seed-pod encircled by

two whorls of lotus-petals exhibits lotus petals on the *vikarnas.* The *garbhagriha* is entered through a moulded doorsill. The upper architrave *(uttaranga)* shows *garudasina* Vishnu in the centre while to the north and south are depicted four-armed Siva and Brahma. The doorframe is of *trisakha* variety carved with bands of stencilled wavy lines, lotus petals and vegetal scrolls. On the *pedyas* are portrayed river goddesses, *nagas* in *anjali-mudra* and Vaishnava *dvarapalas.* The vestibule rests on a pair of pilasters carrying an architrave *(patta)* incised with a record dated Samvat 1242 (AD 1185) in Devanagari characters.

The central ceiling of the *sabha-mandapa* studded with female bracket figures and eight *matrikas* is attributable to *sabhamarga* order (pl.XLIII B). The *mukha-mandapa* is provided with a decorated *samatala-vitana* bordered with a bejewelled frame. *Thejangha* is decorated with icons of different forms of Vishnu, two-armed *dikpalas* and *apsarases,* the *vyala* figures being significantly absent. On the northern side, the *kalasa* is pierced through a *makara-pranala.* The treatment of mouldings suggests that the original temple was built in *circa* eleventh century. The curvilinear *pancharatha sikhara* and other members of superstructure are later accretions. Each corner shrine consists of a *pancharatha garbhagriha,* an *antarala andpraggriva* (pl.XLIV A). They are identical in conception and interestingly in recesses of *antaralas* of northwestern and southwestern shrines are portrayed *simha-vyalas.* The treatment of images affixed dn *their jangha* portions is akin to the main temple.

BUILDING SURVEY.— The Building Survey Project (North), of the Survey, conducted survey and documentation of domestic buildings in south India, with special reference to Kerala and Tamil Nadu. South India is famous for wooden architecture and many such valuable buildings are either utterly neglected or being pulled down.

Kerala is known for its beautiful *Ulan* and *manas* (houses); *kottaram* (palaces) (pl.XLIV B), for which timber and wood are profusely used. Generally the traditional Kerala houses (fig. 24) have open courtyard in the centre with either four quarters *(nalu kattu),* eight quarters *(ettukattu)* or sixteen quarters *(padinafukattu)* all around.

The entrance, provided with delicately carved wooden facade *(pumukham)* is followed by a verandah for visitors. There are a number of rooms provided at the innerside, with utilitarian use, each one with a local name such as *pujamuri, arapura, uttupura,* etc. They are provided with rooms specially for the inmates, separate for gents and ladies and also for the guests. In a bigger model, as in the case *of padinafukattu* and *kottaram,* there is a separate space for the purposes of audience, dining and entertainment.

Besides, richly carved doors, delicate pillars, thick wall beams, decorated ceiling, carved wooden facade, etc., are the main features of the Kerala architecture.

The following buildings in and around Thiruvananthapuram, Kerala, were surveyed, visited and photo documented.—

The Napier Museum Complex; Kanakakunnu Palace; Victoria Jubilee Hall; Observatory and Residence of John Caldecott, the first Director; Old Residency; Thanjavur Amma Veedu; Sree

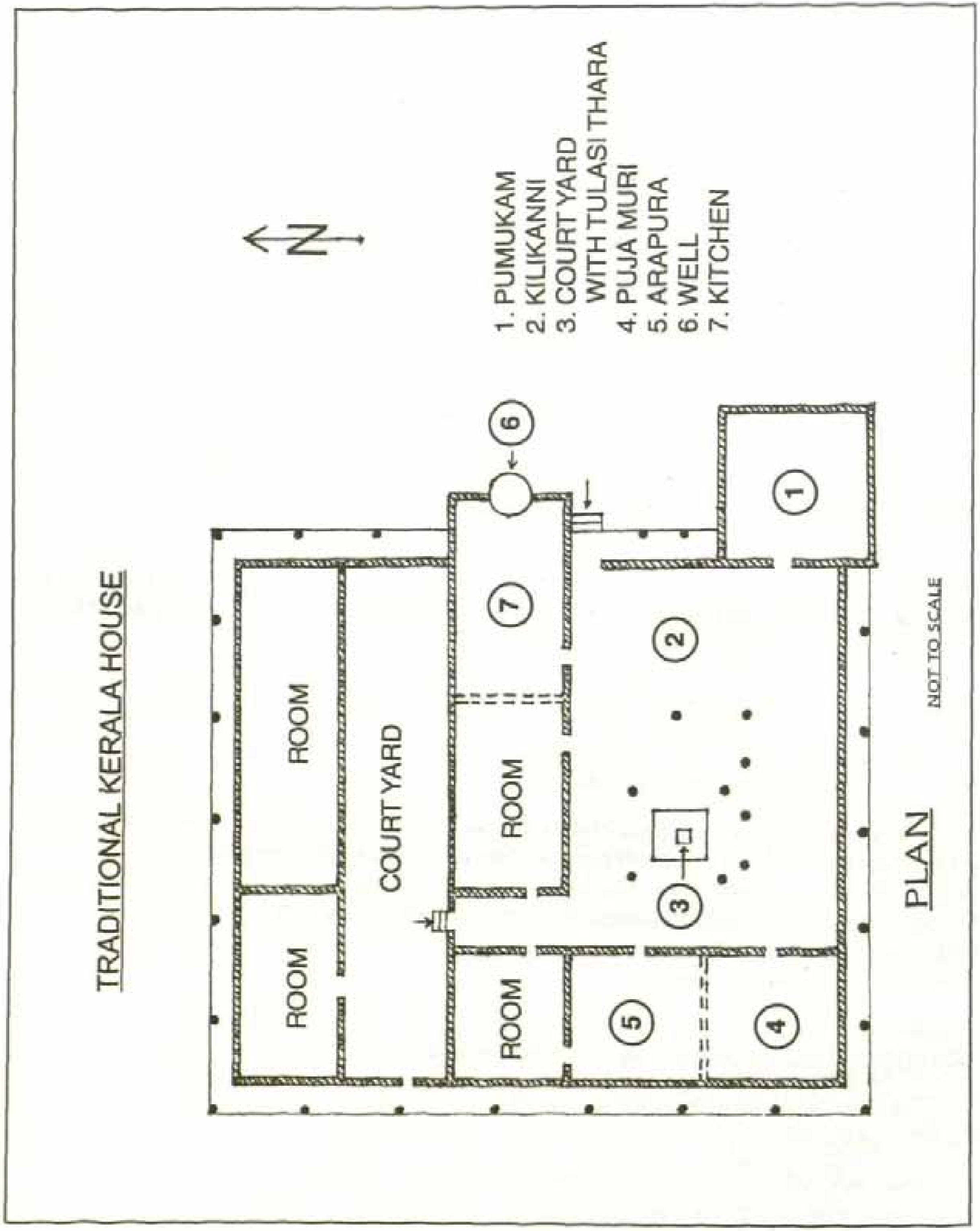

TRADITIONAL KERALA HOUSE
ROOM
ROOM
COURT YARD
ROOM
ROOM
1
2
3
4
5
6
7
1. PUMUKAM
2. KILIKANNI
3. COURT YARD
WITH TULASI THARA
4. PUJA MURI
5. ARAPURA
6. WELL
7. KITCHEN
N
PLAN
NOT TO SCALE

Fig. 24

Kariyathumadom (Nambudiri's house); House of Uloor Paramesvaran Pillai; Pujapura Palace; Manimalika Complex etc.

The Thanjavur Amma Veedu, built by the Travancore King Swati Tirunal Rama Varma (AD 1829-47), for the dancer Sugandavalli of Thanjavur, is a fine example of Kerala traditional architecture of *nalukattu* style (pl.XLYA). On plan the building has open pillared verandah in the centre, with rooms on all the sides. The house is noted for the wooden carved members such as brackets, door-jambs, pillars and ceiling etc. At present the office of Mitra Niketan is functioning at this place. There is another building located on the northern side of the earlier one. This is also known as Thanjavur Amma Veedu (no.2), built by the King Srimulam Tirunal Rama Varma (AD 1885-1924). It has the combination of traditional and colonial architectural influence (pl.XLV B).

The building Sree Kariyathumadom (pl.XLVC), traditionally belongs to the Nambudiri families, who were incharge of the administration of Sree Padmanabhasvamy Temple, Thiruvananthapuram. It is a single-storeyed building having entrance from east, with low roof. It is also in *nalukattu* pattern and noted for perforated panels, brackets, lintels carved with religious and secular themes.

The Manimalika Complex was constructed during the reign of Karttika Tirunal Rama Varma (AD 1738-98), who was responsible for shifting the capital from Padmanabhapuram, District Kanyakumari, to the present Thiruvananthapuram. The Buildings are noteworthy for the gables, beams, balconied windows, brackets and exhibit high standard of architectural and artistic merit.

The Pujapura Palace is double-storeyed structure, and on plan consists of portico, spacious rooms, courtyard with *Tulasi-thara* and other components. The entrance has semicircular arches supported on brick pillars. The domed semioctagonal balcony has *kalasa* at the top. The palace is also known for excellent balustrades, brackets, etc.

The Napier Museum was built in AD 1869 and underwent many additions till 1950. It was purposefully constructed to house the museum objects. It is one of the finest examples for the traditional and colonial architecture. The walls are of laterite and bricks, and the superstructure has sloping tiled roofs. The building is known for its balconies, windows, *gaja-vyala* brackets, tall wooden pillars, painted ceilings, windows fixed with tinted colour glasses (pl.XLVI A).

The Kanakakunnu Palace, which was constructed in the late nineteenth century, is known for its plan and elevation. On plan it is apsidal while the superstructure is having wagon-vaulted tiled roof and the entrance portico is with sloping roof (pl.XLVI B).

IX. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

AGRA CIRCLE

Uttar Pradesh

1. AGRA FORT, AGRA, DISTRICT AGRA.— The deposit of excreta of bats, etc., from the basement cells of the Khas Mahal was removed and the structure was repaired by underpinning the *lakhauri* brick masonry, providing a lime-concrete flooring, stained pointing and lime-plastering.

Repairs to the Moti Masjid complex were also carried out by providing and fixing the red sandstone *chhajjas* on the south as per the original pattern. The work of pointing was also attended to with special lime-mortar on the white marble veneering.

The Nagina Masjid was repaired by providing and fixing of white marble *chhajja-stones,* replacing the broken ones, besides providing and fixing white marble ornamental/a// railing, replacing the broken one and by pointing and plastering with special lime-mortar and by underpinning with *lakhauri* brick-work.

The Machhi Bhavan was repaired by replacing the damaged and broken *chhajja-stones, dasa* stone brackets and *faranda* stones, besides attending to plastering and underpinning.

The damaged and broken lintel and brackets of red sandstone of the Jahangiri Mahal were replaced. The joints were pointed. In the northern quadrangle the red sandstone flooring was done besides plastering, underpinning and stained pointing.

The work of ornamental plastering, underpinning, laying of lime-concrete and stained pointing in Akbari Mahal were carried out.

In Salimgarh, lime-concrete apron was laid out and flooring was done with red sandstone. Repairs were also carried out by plastering, underpinning and stained pointing.

Repairs to the draw-bridge at the entrance of Amar Singh Gate and VVIP path were also carried out.

2. ITMAD-UD-DAULA'S TOMB, AGRA, DISTRICT AGRA.— The wooden door leafs of the main gateway cells at first floor were provided. The cells of the western side *baradari* were also provided with wooden doors and iron angle grated doors to check the trespassers indulging in vandalism. The compound-wall on the east, north and southern sides, was repaired by underpinning, plastering

and pointing. The northeastern corner *burj* was repaired by removing the decayed plaster from walls and ceiling and replastering with special lime-mortar.

3. JAMA MASJID, AGRA, DISTRICT AGRA.— The restoration of the eastern side *minar* was finally completed by attending to the little left out work of the previous year.

4. TAJ MAHAL, AGRA, DISTRICT AGRA.— The badly decayed inlaid panels of red sandstone veneering, panels having embossed floral work and flower designed *dasa* at the eastern facade of the main entrance gate were restored as per original (pl.XLVII). On the southern side, the *pandar dasa* was restored as per original. The inlay marble pieces of black and white colour were provided at places where they were missing in the eastern and northern sides and the work is in progress.

The outer facade of the main mausoleum was watertightened by pointing with special lime-mortar. The inlay-bars of black and yellow marble were provided at missing places. The decayed and damaged stones of *gal'ta* and veneering in the inner facade towards south-west corner of cenotaph chamber were replaced as per the original. Missing inlay bars of black marble in the southeastern corner *minar* and marble railing of the platform towards the western and the northern sides were provided. The projected balcony of southeastern *minar* was repaired by resetting and pointing the loose stones of the south of the main mausoleum. The decayed red sandstone jali and *muttaka* were replaced by new ones.

The decayed and peeled off plaster having painted designs (cut plaster work) in the interior wall faces of the mosque complex was removed and the fresh plaster with painted design was done as per original pattern (pl.XLVIII). The decayed, sunken red sandstone floor with geometrical pattern on the southern side of the mosque was repaired by providing the fresh stones at places.

The dacayed and peeled off plaster with painting work on the interior and arches of the Mehman Khana complex, were replaced by providing special lime-plaster. The broken red sandstone *chhajja* of the south-west corner *chhatri* was replaced with a new one. Pointing work was attended to at the dome of the *chhatri* and on the outer facade towards south side of the Mehman Khana.

The bulged portion of the *lakhauri* brick wall of enclosure-wall and southwestern *burji* was reconstructed as per the original. Decayed stones of veneering and *chhajja* near the western gate were replaced with new ones (pl.XLIX). The outer facade of the wall was pointed.

The southwestern Saheli Burj was repaired by resetting the loose and sunken stones and providing the missing stones at the floor of tomb, channels and facade. The entire wall surface was watertightened by pointing.

The toilet-block with all the modern facilities have been provided in the southwestern corner.

Besides, public conveniences like drinking water facilities were provided by installing a jet pump and a cooler cabin.

The door of the eastern side enclosure-wall was repaired and provided with MS sheet.

5. GROUP OF MONUMENTS AT FATEHPUR SIKRI, DISTRICT AGRA.— The structures of mint complex were repaired by attending to the coarse rubble-stone masonry. The pathways on the northwestern and northern sides of Diwan-i-Am were pointed. The work of laying red sandstone flooring over a base of lime-concrete besides pointing the joints were attended to. The verandahs of Diwan-i-Am were also attended to. A mild steel grill railing was fixed along the road near Jodhbai booking and Khushbookhana to prevent the encroachment of intruders and animals.

Recessed pointing of the walls of cells of Baland-Darwaza and the basement cells of Jama Masjid was also attended to after raking out the joints.

Loose inlay-work of the Badshahi Gate was restored. The stained pointing work was attended to in the tomb of Islam Khan. The damaged white marble stone *Jali-screens* of the tomb of Sheikh Salim Chishti was replaced. The inlay bars of black marble were fixed wherever required. The pointing work was carried out with special lime-mortar on the white marble stone floor, walls, ceiling, *chhajja* and parapet. The roof of the tomb was watertightened.

Compound-wall was constructed with random rubble masonry and coarse rubble-stone masonry along the road side from Baland-Darwaza to Shah Quli Baoli to check the encroachments.

6. AKBAR'S TOMB, SIKANDARA DISTRICT AGRA.— The main entrance gateway was repaired by replacing the decayed and sunken flag-stone flooring and by restoring the missing inlay-pieces. In the main mausoleum, the plastering work was carried out after removing the old, decayed and bulged-out plaster as per the original. The flagstone flooring was done towards the southern side causeway.

7. GROUP OF TEMPLES, BAIJNATH, DISTRICT ALMORA.— In the main temple, the wooden frame and the tin shed of the old canopy, damaged by termites and rusting were replaced.

8. SATYANARAYANA TEMPLE, TALLIHAT (BAIJNATH), DISTRICT ALMORA.— This ruined temple containing a number of loose sculptures was fenced with a stone masonry boundary-wall with a M.S. Grill and gate as a preventive measure. Stone apron over concrete base was provided to the temple structure. The wooden door and windows adversely affected by the termites were replaced with new ones.

9. GROUP OF TEMPLES, DANDESVARA, PUTLI GUNTH, DISTRICT ALMORA.— The open courtyard of the temple-complex was provided with flag-stone flooring as per original pattern.

10. GROUP OF TEMPLES, JAGESVARA, PHULAI GUNTH, DISTRICT ALMORA.— The canopy with wooden frame and tin sheet was provided to Kedarnath Temple, Prushti devi and to the *mandapa* of Mahamrityunjaya Temple in place of decayed and damaged canopies. The low compound-wall of the monument-complex was raised, mounted with a regular barbed-wire fencing with angle iron posts. Stone apron was provided around the small temples with a base concrete. The dilapidated *bhogasala* of the main temple was restored as per original pattern. Besides, the construction of a sculptureshed near the temple-complex is in progress.

11. Tomb of Iglas Khan, Badaun, District Badaun.— The dome of the tomb was restored with *lakhauri* brickwork and moulded ornamental plaster work as per the original. The floor was relaid with brick ballast mixed with lime-mortar. The eastern side wall of the tomb was repaired by underpinning with *lakhauri* brickwork.

12. ASOKAN ROCK-EDICT, KALSI, DISTRICT DEHRADUN.— A breast-wall was constructed with coarse rubble-stone on the eastern side of the Chaukidar quarter and on the western side along the PWD road and on the back side of Asokan Edict.

13. MOSQUE AND SARAI, KHUDAGANJ, DISTRICT FARRUKHABAD.— Repair-work was carried out by plastering the arches, roofs, walls and domes along with restoring the ornamental moulded work on the plaster. The damaged *minar* was restored with brickwork and pinnacles were fixed. The western side retaining wall was repaired with brickwork. In the Sarai, the cells were repaired by underpinning the patches of brick-masonry.

14. ARCHAEOLOGICAL SITE AT SANKISA, DISTRICT FARRUKHABAD.— The work of beautification by plantation of trees, hedges and vegetational fencing was attended to.

15. JUGAL KISHORE TEMPLE, VRINDAVAN, DISTRICT MATHURA.— The boundary-wall was raised along with iron-grill railing on its top and iron-grill gate to protect the temple limits from the encroachment.

16. R.C. CEMETRY, SARDHANA, DISTRICT MEERUT.— Plaster work was carried out in ten graves. The boundary-wall was constructed with brickwork and flooring was done with lime and brick ballast.

17. BALESHVARA TEMPLE, CHAMPAWAT, DISTRICT PITHORAGARH.— The work of flagstone flooring over base concrete around the temple was taken up. The boundary-wall was also constructed on the western side of the temple for safety.

AURANGABAD CIRCLE

Maharashtra

18. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD.— Small portions of damaged parapet-wall due to fallen rock from top of the caves, were repaired. Improved track-light system was provided for the paintings of Cave 17.

19. CAVES, AURANGABAD, DISTRICT AURANGABAD.— The work of providing canopy over the sculpture of Buddha in Cave 5 was taken up to protect the same from weathering. The missing side walls of the cave were raised to support the canopy. The broken portion of the rock-cut stupa of the *chaitya* was mended as per the original.

20. TOMB OF RABIA-UL-DURANI (BIBI-KA-MAQBARA), AURANGABAD, DISTRICT AURANGABAD.— In continuation of the previous year's *(1994-95,* p. 108) work, providing Mughal plastering to the arches of the western compound-wall (pi. L) was completed. The damaged brick

masonry wall arches were repaired. Roof of the Museum and Library was watertightened. The work of barbed-wire fencing in front of the monument was completed.

21. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD.— The work of providing barbed-wire and chain link fencing along the road was taken up under Ajanta-Ellora Conservation and Tourism Development Project. The work of laying tar road from Cave 10 to Cave 32 was also taken up.

22. GRISHNESHVARA TEMPLE, VERUL (ELLORA) DISTRICT AURANGABAD.— In continuation of the previous year's {*1994-95,* p. 108) work, the worn-out projected stones of the *chhatri* were mended as per the original. Temple-type wooden door was also provided.

23. PITALKHORA CAVES, TALUKA KANNAD, DISTRICT AURANGABAD.— One M.S. foot bridge was provided across the *nala* near Cave 1 for easy movement of visitors during rainy season (pi.LI).

24. FORT-WALL, PAONI, DISTRICT BHANDARA.— The work of resetting the dislodged stone of the fort-wall and providing new stones at missing places is in process.

25. ENCLOSURE AND BUILDINGS OF GOND RAJA'S TOMB, CHANDRAPUR, DISTRICT CHANDRAPUR.— The work of strengthening the existing enclosure-wall on river side by filling up the cavities, gaps in wall and underpinning, reconstruction of the fallen portion with available stones was taken up.

26. GROUP OF TEMPLES, MARKANDA, DISTRICT GADCHIROLI.— Plinth*prakara* was provided to different sub-shrines of the group of temples at Markanda.

27. CHANGDEO TEMPLE, CHANGDEO, DISTRICT JALGAON.— The work of dismantling and reconstruction of out-of-plinth *prakara*-wall of the temple on river side with available stones has been taken up(pl.LII).

28. ANCIENT BUDDHIST REMAINS, MANSAR, DISTRICT NAGPUR.— The work of providing barbed wire fencing to the ancient site is in progress. Conservation of the excavated remains was also taken up.

29. GONDESHVARA MAHADEVA TEMPLE, SINNAR, DISTRICT NASIK.— The work of providing lightning-conductor to the temple was completed.

30. TRAMBAKESHVARA TEMPLE, TRIMBAK, DISTRICT NASIK.— Lightning-conductor of the temple was repaired and made functional.

31. CAVE TEMPLES AND INSCRIPTIONS, KARLE, DISTRICT PUNE.— Repairs to the masonry steps and wall near bridge were carried out.

32. ELEPHANTA CAVES, ELEPHANA ISLAND, DISTRICT RAIGAD (KOLABA).— Reconstruction of fallen retaining wall and parapet-wall is in progress.

33. OLD FORT, SHOLAPUR, DISTRICT SHOLAPUR.— Reconstruction of the fallen portion of the fort-wall was attended to by using available stones.

34. BUDDHIST CAVES, KANHERI, DISTRICT BOMBAY SUBARBAN.— R.C.C. covers were provided to the rock-cut cistern for different caves. One M.S. foot bridge was provided across the *nala* (pl.LIII) for giving easy approach to the group of caves on the other side during rainy season.

35. FORT AND OLD PORTUGUESE REMAINS, BASSEIN, DISTRICT THANE.— In continuation of the previous year's work *{1994-95,* p.109), plastering of the inner walls of the Gonsalves Church inside the Bassein Fort was continued.

36. MOUND KNOWN AS "SONAR BHAT", NALASOPARA, DISTRICT THANE.— In continuation of the previous year's work *(1994-95,* p. 108), the barbed-wire fencing of the monument was completed.

BANGALORE CIRCLE

Karnataka

37. FORT, DEVANAHALLI, DISTRICT BANGALORE.— The work of dismantling the damaged portion of the bastion and fort-wall along with its core-filling for reconstruction is in progress.

38. TIPU SULTAN PALACE, BANGALORE, DISTRICT BANGALORE.— The disturbed, undulated stone pavement on the western side of the Palace was relaid after resetting sewerage hume pipe to drain out sewerage and rain-water.

39. MUSEUM BUILDING, KAMALAPURAM, DISTRICT BELLARY.— Dwarf-wall crimped wire netted fencing has been provided in front of the museum.

40. GROUP OF MONUMENTS, HAMPI, DISTRICT BELLARY.— The excavated structure of the Noblemen Quarter No. 16 was conserved by resetting the loose members and watertightened.

The walls (24-5mx9-70m) of Structure No. 1, north of the Hazara Rama Temple, facing east have been conserved.

The walls (25-45mx6-45m) of Structure No. 2, facing south have also been conserved.

The enclosure-wall in the northern part of the structure has also been conserved. This wall in east-west direction is about 42 mx 1 -2-40 mx 1 -80 m.

41. ACHYUTARAYA TEMPLE, VENKATAPURAM, DISTRICT BELLARY.— The disturbed undulated floor of the main entrance at north has been relaid over a sand cushion replacing the damaged ones. The passage between the two enclosures all around the temple choked with debris was cleared. The missing roof stones of the eastern cloister *mandapas* of the second enclosure was provided. The disturbed and fallen heavy beam of the eastern entrance was suitably mended with non-magnetic stainless steel rods and rehoisted and fixed to original position. A pillar was mended with the help of 12 to 25 mm non-magnetic stainless steel rods and set to plumb in original position. Ugly looking uncoursed rubble-masonry wall provided at the main entrance at north has been dismantled and fresh veneering courses to the main wall and core filling of the first enclosure to the north of the main entrance was carried out. During the process of the above, disturbed and out-of-plumb veneering wall to the main entrance was dismantled and reset with granite slabs. The roof of the

cloistered *mandapa* towards north-east and wherever necessary on the eastern side was carried out (pl.LIV).

42. VITTHALA TEMPLE, VENKATAPURAM, DISTRICT BELLARY.— The inner side of the eastern *gopura* was strengthened by providing fresh *sal*-wood logs and the precariously over-hanging brick work was suitably underpinned in fresh bricks replacing the worn-out ones and the cracks were suitably filled in lime-mortar.

The disturbed and fallen wall of the *utsava-mandapa* to the south-east of the main *mahadvara* outside the *prakara* was erected with due core-filling between the external and internal veneering. The disturbed floor was relaid over a sand cushion and the pillars earlier removed for conservation work were realigned. After resetting the extent *chhajja* in the northeastern corner over the pillars, the extent stucco *kudu* motif was reset. The octagonal shaft of the *dipastambha* is being mended.

43. GALAGANATHA TEMPLE, AIHOLE, DISTRICT BIJAPUR.— The protected limits of the monuments all along the river side was provided with a compound-wall and finished with requisite coping.

The disturbed and dilapidated *mandapas* in the complex were reset to plumb with the available pillars, capitals and lintel pieces and fresh roof slabs were provided with simple offset mouldings wherever required.

44. MEGUTI TEMPLE, AIHOLE, DISTRICT BIJAPUR.— The missing architectural members like lintel, beams, roof slabs and hood stones were provided with new ones to match with the adjoining members and the leaky roof was watertightened by pointing the joints (pl.LV).

45. VENNIYARGUDI, AIHOLE, DISTRICT BIJAPUR.— The deteriorated, degenerated and weathered wall portion of the Temple No. 1/92 has been replaced with fresh stone members and new ones were provided wherever missing. The highly undulated disturbed floor stones were carefully dismantled and realigned properly and fresh stone pavement with curb stone was provided around the temple.

The out-of-plumb *mukha-mandapa* and wall portion of Temple No. 1/94 was carefully dismantled after proper documentation and reconstructed as per the original to the plumb line. The missing and damaged stone members were replaced afresh. The roof was rendered watertight by grouting in cement-mortar with weather proof compound and pointing wherever necessary. The pavement in front was relaid in stone and an apron was provided with necessary curb stone over a gravel bed.

46. MUKTESVARA TEMPLE, CHOWDADANAPURA, DISTRICT DHARWAD.— Out-of-plumb steps of the *ghat* leading to the river to the north of the temple was dismantled and reset after proper levelling and pitching in dry masonry. An additional flight of steps were provided at the river bed to prevent denundation of the embankment.

47. BIRTH PLACE OF HAIDER ALI, BUDIKOTE, DISTRICT KOLAR.— The damaged rectangular enclosure making the area of Haider Ali's birth place was reconstructed to plumb and the joints of

stones of the walls were pointed, matching the original. To prevent the growth of rank vegetation and stagnation of water around the plaque marking the place of birth, dressed stone flooring has been provided.

48. SOMESVARA TEMPLE, KOLAR, DISTRICT KOLAR.— The cavities caused due to the decay of vertical wooden members in front *tala* of the main *gopura* were filled by grouting and suitably underpinned. The dead and the decayed plaster over the inner wall surfaces of the *gopura* was raked out and replastered as per the original.

49. SRIKANTHESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE.— The old decayed weather proof course over the roof was raked out to a depth of 18 cm using lime brick-jelly concrete and surface plastered in combination mortar to arrest leakage of water. The windows of the Sivakoshtha, Devakoshtha and the Pakasala were replaced.

50. KIRTI NARAYANA TEMPLE, TALKAD, DISTRICT MYSORE.— The sand deposit was removed and the *adhishthana was* exposed on the southern and northern sides. To prevent the falling of over-hanging members, necessary support was provided with gunny bags filled with sand (pl.LVI).

51. TRIPURANTESVARA TEMPLE, BELLIGAVI, DISTRICT SHIMOGA.— The protected area around the monument was fenced with barbed-wire using iron 'L' angles fixed in cement-concrete bed.

52. KAITABHESVARA TEMPLE, KOTIPURA, DISTRICT SHIMOGA.— A retaining wall in laterite was constructed around the sub-shrine to the south-east of the main temple and the roof watertightened by providing cement-concrete. The accummulated debris to the north-west of the main temple was removed.

53. SHIVAPPA NAYAK'S FORT, NAGAR, DISTRICT SHIMOGA.— The ancient well located in the northeastern corner of the fort was desilted and the vegetation on the eastern side of the fort-wall was removed.

54. JUMMA MASJID, SIRA, DISTRICT TUMKUR.— The thick lime accretions and the rank vegetation in the monument have been removed and the original wall surface has been brought to light.

BHOPAL CIRCLE

Madhya Pradesh

55. FORT, ATER, DISTRICT BHIND.— The scientific clearance was carried out in addition to the removal of settled debris outside the palace-complex and by sorting out the stones. A part of the collapsed wall was taken up for restoration with old stones collected from the debris in lime, *surkhi* and sand-mortar, matching the original. The decayed lime-concrete floor and roof terrace were laid in fresh lime-concrete.

56. KAMALAPATI PALACE, BHOPAL, DISTRICT BHOPAL.— The collapsed rear balconies of this palace facing the lower lake were restored matching the original and the damaged roof terrace was watertightened. One hall and a room at the ground floor and a hall at the first floor were provided with false ceiling.

57. GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATARPUR.— The worn-out and damaged G.I. barbed-wire fencing on angle iron posts on the rear side of Chitragupta Temple was replaced with stone masonry dwarf-wall, mounted with mild steel grill for security.

The excavated structural remains and the ancient temple site at Pahadia were enclosed with barbed-wire fencing on angle iron posts for the safety and security of the excavated remains: A hut for the watchman was also provided at the site to facilitate round the clock throughout the year.

The old worn-out and damaged barbed-wire fencing on angle iron posts in Kandariya Mahadeo Temple was replaced with stone masonry dwarf-wall, mounted with M. S. grill for safety and security of the temple. On fresh verification and measurement of the area on the west of the temple, which was encroached upon, was got vacated and the same is now being enclosed with stone masonry dwarf-wall, mounted with M. S. grill.

The brick masonry railing on either side of the main staircase of Matangesvara Temple constructed at a later date, was removed and replaced with M. S. pipe railing to retain its original appearance. The *sikhara* of the temple was also watertightened to check the leakage of rain-water.

58. RANEH MATH, RANEH, DISTRICT DAMOH.— The encroachment towards the monuments were partly removed. After removing the structural debris, the traces of a portion of the monument could be located on plan. Further probe, however, proved interesting, as one of the pillars of the ancient structure was found *in situ,* forming part of a modern house.

59. FORT, SINGORGARH, DISTRICT DAMOH.— Deep-rooted vegetational growth along with the tank in the immediate surroundings of the guardroom-complex was uprooted. The bulged-out, damaged and missing portions of the gateways and arched openings were also restored in plumb and alignment and were finished with a layer of lime-concrete (pl.LVII). The main staircase to approach the roof terrace and the parapet-walls were also conserved. The dumped and settled debris of the fallen structures deposited in the cells were excavated and thrown outside the complex. The bulged, damaged and fallen stones of the stepped-tanks were taken out carefully after proper documentation for resetting the same in plumb and alignment. The tank was also watertightened to check the seapage of water. The work is in progress.

60. BEERSINGH PALACE, DATIA, DISTRICT DATIA.— Replacement of old, decayed and damaged concrete of the floors and roof terrace of upper storey with fresh lime-concrete was taken up and the work is in progress. The damaged portion of the plaster of walls, roof of upper storey and floors were also taken up for conservation in *lime-surkhi* mortar. The halls and the balconies of the upper storeys, richly painted with floral and geometric pattern were provided with doors. The work is still in progress.

61. BUDDHIST CAVES, BAGH, DISTRICT DHAR.— In continuation of the earlier work *(1993-94,* p. 163), the construction of RCC pillars, beams and slabs in place of missing rock-cut pillars and beams in Cave 7 were taken up, along with guniting the walls of the cells. The old damaged floor of the foreground of Cave No. 6 was also replaced with fresh lime-concrete floor.

62. MONUMENTS AT MANDU, DISTRICT DHAR.— The walls and the arches supporting the roof of underground cells of Champa Baoli had caved in and the underground cells were filled with the debris. The settled debris of the underground cells was excavated and removed. The walls and arches were underpinned and plastered to strengthen the structure and made watertight from the top. The decayed and missing lime-concrete flooring was replaced with fresh lime-concrete matching the original. The damaged dome in front of Champa Baoli was also restored with brick masonry in *lime-surkhi* mortar. During the conservation of the dome, copper pipe lines embedded in walls, floor and entrance to the Baoli were discovered. It seems that water used to be flown through these pipes in order to keep the structure cool during the summer months.. Arched openings of the walls on the ground floor facing the courtyard and Munja Talao were also conserved. During the removal of debris, the exposed arches and flooring were found originally provided with coloured tiles.

The cracked, damaged and missing arches of Chishti Khan's Tomb were restored in R. R. stone masonry in lime-mortar. The damaged and missing flight of steps were also restored on the basis of evidence available. Angle iron door shutters, too, were provided at the entry point of the flight of steps and in the compound-wall of the complex for safety and security of the monument.

Major parts of the dome and arches of Daria Khan's Mosque were not only damaged but even the outer wall had gone out-of-plumb. Even the plinth of the flooring had also decayed and damaged. The damaged and missing arches and domes were restored in R. R. stone masonry. The out-of-plumb portion of the wall was brought down and restored in plumb and alignment, matching the original. The damaged and missing veneering stones of plinth were also replaced with fresh fine chisel-dressed limestones in tune with the original. The work of replacement of decayed, damaged and missing stone flooring with fresh fine chisel-dressed stone and flooring on lime-concrete base has been proposed to be continued.

The cells of Gada Shah's Shop were filled with debris of fallen superstructure. The settled debris inside the cells were first excavated and then thrown outside the complex after sorting out the useful stones for re-use in the conservation. The debris stacked outside the complex was also thrown away. The damaged and missing arches of the first floor and flight of steps were restored cautiously reproducing the original style of the arches. The work is in progress.

The damaged and missing stone *chhajjas* of the ground floor in front of Jahaz Mahal are being replaced freshly with departmentally quarried fine chisel-dressed Zeerabad limestone *chhajjas.* The work of replacement of damaged and missing *chhajjas* of the first floor with new ones was also started. Edging of partly flaked off lime-plaster and restoration of damaged and missing R. R. stone masonry wall were also taken up.

One of the domes of the top terrace of Roopmati Pavilion was damaged due to lightning and was strengthened by resetting the displaced stones and filling the cracked portion. It was also provided with a stone masonry battered retaining wall from outside for strengthening the structure. With a view to restore the half damaged dome and bring the structure in perfect plumb and alignment maintaining its originality by removing the retaining wall, limestone blocks in the required size

were quarried departmentally from Zeerabad quarry and transported upto the site. These limestone blocks were dressed for placing them at proper places.

The main entrance building of the Taveli Mahal complex was conserved and provided with angle iron door shutters for safety and security. The floors were also repaired with fresh lime-concrete.

63. JAL MAHAL, SADALPUR, DISTRICT DHAR.— The restoration of damaged and missing underground water channels, followed by relaying of damaged/decayed lime-concrete flooring, restoration of damaged wall in R.R.stone masonry, repairs to the arches and watertightening of the roof terrace were taken up during the year under report and the work is in progress.

64. AHUKHANA, BURHANPUR, DISTRICT EAST NIMAR.— A major portion of the brick masonry high compound-wall enclosing the area around had bulged, and collapsed. During the year, damaged and fallen portion of the compound-wall, using specially prepared bricks of the same size, was restored and almost completed.

65. TOMB OF SHAH NAWAZ KHAN, BURHANPUR, DISTRICT EAST NIMAR.— The worn-out and damaged G. I. barbed-wire fencing on angle iron posts were replaced with dwarf stone masonry wall mounted with G. I. barbed-wire fencing with a view to maintain the enclosed area and to stop its misuse.

66. PALACE-COMPLEX, FORT-WALL, BURHANPUR, DISTRICT EAST NIMAR.— Multi-storeyed palace building, which was in a very bad state of preservation along with the fortification wall was taken up for major repairs. The damaged staircases to reach upto the basement storeys were also conserved. The arch openings on the outer side, facing the river front, were provided with M. S. grills to stop the unauthorized entry into the monument. Cracks in walls and arches were properly stitched and sealed. The decayed and damaged lime-concrete floor of the underground cells were relaid with fresh lime-concrete after filling the cavities in R. R. stone masonry base (pl.LVIII).

67. SINGHPUR PALACE, CHANDERI, DISTRICT GUNA.— The bulged and missing portions of the compound-wall were restored in plumb and alignment. The out-of-plumb wall of the palace was also taken up for restoration.

68. MANSINGH PALACE, GWALIOR FORT, DISTRICT GWALIOR.— The courtyard of the palace was provided with stone pitching to arrest leakage in the lower storeys. The dumped and settled debris of the guardroom-complex were dug and thrown away. The damaged and missing stone flooring and facing stone slabs of the complex were restored as per the original. The decayed, and missing beams, veneering stones and *chhajja-stones,* too, were restored with fresh fine-chiselled ones.

69. TOMB OF MOHAMMAD GHAUS AND TANSEN SAMADHI COMPLEX, GWALIOR. DISTRICT GWALIOR.— The open area was cleaned, levelled and a garden laid in the complex. Repairs to the compound-wall, grave platforms, the tomb of Mohammad Ghaus and samadhi of Tansen were also undertaken. The repairs and replacement of damaged and missing stone *jalis* with intricate pattern provided at the Mohammad Ghaus Tomb and Tansen Samadhi were also carried out. A stone masonry dwarf wall mounted with M.S.grill in front of Mohammad Ghaus Tomb complex was also raised to regulate

the entry of visitors to the garden and check encroachments. The construction of additional stone masonry dwarf-wall mounted with M.S. grill, immediately outside the Mohammad Ghaus complex was taken up and completed to avoid the misuse of vacant land and check encroachment. An additional stone masonry compound-wall mounted with M.S.grill was also constructed on the rear side, to check unauthorized entry of the local residents. The conservation of damaged interior plaster of the dome of Mohammad Ghaus Tomb was also taken up and the work is in progress.

An additional borewell for irrigation of plants and garden in the complex of Mohammad Ghaus was also provided. Besides the work of replacement of damaged and missing screens *(jalis)* of Jama Mosque(pl.LIX) with fresh ones, of the same geometrical patterns, along with cut-stone masonry at the base was partly completed. The arched openings of Bahu-Ka-Hujara in the Mohammad Ghaus complex was provided with M.S. grill door shutters to check its misuse by the visitors. The replacement of dacayed and damaged base stones of the stone *jalis ofbaradari* with fresh fine chisel-dressed Tantpur stone has also been taken up and the work is in progress.

70. CHAUSATH-YOGINI TEMPLE, BHERAGHAT, DISTRICT JABALPUR.— Circular shrine of Chausath Yogini is located at a hill on the bank of the River Narmada. The damaged railing provided on the approach steps and around the shrine was repaired and painted. The decayed and damaged roof concrete of the shrine was also replaced with fresh lime-concrete and made watertight.

71. MADAN MAHAL, JABALPUR, DISTRICT JABALPUR.— Scriblings on the walls and ceiling of the palace and the rock surface were cleaned chemically and an entrance gate was provided to stop disfigurement of the monument. The stable in the complex was underpinned with stone masonry in lime-mortar. The decayed and damaged floor concrete and roof terrace were replaced with fresh lime-concrete and the roof terrace watertightened. The area around the monument was taken up for enclosing it with stone masonry compound-wall. The work is in progress.

72. VISHNU VARAHA TEMPLE, KARITALAI, DISTRICT JABALPUR.— The remains of a Vishnu Temple were exposed earlier besides recovery of a large number of stone sculptures. Keeping in view the safety and security of loose sculptures, kept at the site, a stone masonry dwarf-wall mounted with M. S. grill instead of worn-out and damaged G. I. barbed-wire fencing on angle iron posts was decided to be provided and the work is in progress.

73. TEMPLE-COMPLEX, BATESVARA, DISTRICT MORENA.— Vegetation and debris clearance around the group of fallen temples were undertaken to expose them before taking up the conservation. Desilting of the masonry tank was also carried out to expose its buried lower courses. The work of restoration of the shrines by using the fallen architectural members in dry stone masonry and copper clamps has been taken up. The restoration of the fallen rear wall of the Garhi in lime-mortar is also in progress. The open arches of the verandah of the Garhi were provided with M. S. doors for the safety and security of store articles, architectural members, loose sculptures, etc., found during the clearance work.

74. GARHI, PADAWALI, DISTRICT MORENA.— Garhi having richly carved *mandapa* and the *dharmasala* was built exactly on the platform of an earlier constructed temple with the result that

the original entrance gate along with flight of steps were totally blocked (pl.LXA). The work of restoration of the entrance including the damaged staircase was taken up. The blocked original entrance was opened to expose the main entrance and the flight of steps (pl.LXB). Dumped and settled debris within the temple-complex was also removed. Decayed and missing inner enclosure-wall of Garhi and cells abutting it were also restored in dry stone masonry.

75. KAKANMATH TEMPLE, SUHANIA, DISTRICT MORENA.— The veneering stones of *jagati* were restored, but for the top two courses, with fine chisel-dressed ashlar stone masonry reproducing moulded designs in bold outline after dismantling (pl.LXIA) the missing and bulged-out veneering stones. A random rubble-stone masonry retaining wall was also provided on the inner side to retain the earth pressure of the platform. The bulged and out-of-plumb flight of steps to approach the temple platform was also restored as per the original with fine chisel-dressed ashlar stone masonry (pl.LXIB).

76. RANGMAHAL, AJAIGARH FORT, AJAIGARH, DISTRICT PANNA.— The debris of the fallen portions of the temples were removed after sorting out the architectural members and useful stones. The architectural members and the stones are proposed to be reused during conservation. Scientific debris clearance around the monuments to find out the extent and nature of the temple platform was also carried out. The work is in progress.

77. ROCK-SHELTERS, BHIMBETKA, DISTRICT RAISEN.— The protected area around the rock shelters of the main group at Bhimbetka was enclosed with G.I. barbed-wire fencing on R.C.C. posts. The work is in progress.

78. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN.— The work of conserving broken arm of *gauri-patta* and *pranala* was started. A huge block of stone measuring 6 m has been quarried. The stone block is being finely chiselled as per the original and would be fixed at its proper position with the help of 20 mm stainless steel rods and polymer adhesive mixed with stone dust. Similarly, the damaged and missing stone slabs of the northern and western balconies are also being replaced with fresh fine chiselled slabs, matching the original.

79. FORT, RAISEN, DISTRICT RAISEN.— Restoration of damaged, bulged and out-of-plumb fort-wall facing Chopara Tank in dry stone masonry in plumb and alignment was taken-up after dismantling the bulged and out-of-plumb portions of the fortification wall. The work is in progress. A full size angle iron gate with a window is being provided at the Chopara Gate to regulate the entry of unauthorized persons and cattle inside the fort.

80. BUDDHIST MONUMENTS, SANCHI, DISTRICT RAISEN.— Buddhist monuments at Sanchi were included in Sanchi and Satdhara UNESCO Project. It included mainly the revival of ancient tanks and environmental development by way of large-scale plantation and creation of greenery at Sanchi hill. The ancient Tank No. 1 at Sanchi was revived by undertaking its proper conservation and watertightening. The work of revival of Tank No. 2 was also taken up and the same is in progress (pl.LXII). For pumping water up the hill from an ancient well near Kanak Sagar to feed Tank Nos. 1 and 2 for irrigation of plants, a pump house was constructed near the ancient well and a three-

phase electric line provided to operate the electric pump. The damaged, crushed and out-of-plumb veneering stones of the southern wall of Structure No.43 has been replaced in part with fresh stones placed in plumb and alignment. The work is in progress.

81. BUDDHIST MONUMENTS, SATDHARA, DISTRICT RAISEN.— In continuation of the last year's work *{1993-94,* p. 166), restoration of Stupa 8 was taken up quadrant-wise to avoid any deviation in the original shape. After these were properly documented and numbered course-wise, the veneering stones were dismantled one-by-one from the top and arranged systematically on the ground at a short distance. The core of the stupa which was found packed with random rubble stones in mud-mortar was also removed from the top. While removing the core, a stone relic chamber was noticed at about 60 cm, below the extant top of the stupa, with a cap-stone in dislodged position as it appears to have been exposed earlier in search of relic casket. As expected, the chamber was found totally empty. The relic chamber was built by erecting four vertical slabs on the four sides as walls and placing two slabs horizontally, one each for the base and the top. The basal course of the stupa was found lying just over the bed-rock. The uneven bed-rock surface was made plain by giving packing of stone. An underground drain for the disposal of rain-water from the western edge of the stupa upto the platform on the west was also found, fully choked with silt, etc. With a view to maintain originality and also to make it purposeful, the drain was opened, cleaned and revived.

While undertaking restoration, absolute care was taken to maintain originality (pl.LXIIIA). The veneering stones were reset in their original places. It was also ensured that the courses of the stone stupa runs all along the periphery at its original level. While the core of the stupa was packed with random rubble-stones in *lime-surkhi* and sand-mortar in place of mud-mortar to strengthen the core, due care was taken not to allow the mortar used visible from outside. The stone relic chamber was restored to its original position and covered with lid in the manner, it was found at the time of dismantling. The stupa was restored upto the extant height (pl.LXIIIB). Only the damaged and missing portions of the stupa was restored. It was finally watertightened from the top giving a gentle slope towards the periphery. To drain off the rain-water, which might get into the core, weep-holes were also provided at each course, in concealed fashion. On top of the level so watertightened, loose random rubble-stones were placed haphazardly. The open area around Stupa No.8 was subsequently levelled and provided with red *murrain* spread. It is proposed to plant a few wild tree saplings, little away from the platform wall in the next rainy reason.

The Stupa No.l (pl.LXIV), the largest out of forty so far discovered at the site, was also taken up for restoration. To begin with, the veneering stones in *in situ* position were duly numbered, quadrant-wise. The centre point of the stupa was fixed on top and its circumference checked and marked on ground, using triangulation method of surveying. The help of theodolite was also taken to mark points on the ground as well as on top of the stupa. With a view to achieve accuracy in the circumference of each course of veneering stones it has been decided to fix a graduated horizontal bar with the central pole of the stupa. It has been designed in such a way so that it could rotate all around the stupa as per convenience. Its other end might rest over the tubular scaffolding to avoid sagging.

In addition to the above, eight galvanized iron pipes have also been raised at equal distances all around the stupa at ground level to measure height of each course from the working level of the stupa. The*pradakshina-patha* has been taken as the yardstick to determine the working level. The vertical poles so erected have been graduated at a distance of 10 cm.

The work of dismantling the stupa which was started from northeastern quadrant revealed that mud was basically used as binding medium. While the mud-mortar has washed away from the veneering stones due to percolation of rain-water, which gives an impression as if these were originally set in dry masonry, the mud-mortar was still found sticking to the stone blocks and random rubble-stones used in packing the gap between the veneering stones and the brick stupa. Apart from other factors, use of mud as mortar was also the reason for damage caused to the stupa and falling of the veneering stones. The reason being disturbance caused in their original position after the mud got washed away due to rains. Percolation of rain-water into the core of the stupa resulting increase in volume of mud added further damage to the structure, by way of pushing the veneering stones out-of-plumb.

While undertaking restoration of the northeastern quadrant of the stupa, absolute care was being taken to provide gentle slope towards the periphery. Weep-holes, in concealed fashion, were also being provided to allow the rain-water to drain out easily, in case it gets into the core in pockets. The veneering stones being restored were given minute inclination towards the core so that its centre of gravity lies mainly on the basal course towards inner side. While *lime-surkhi* (brick powder) and sand-mortar (being prepared in traditional manner) were being used for setting the random rubble-stones between the veneering stones and the brick stupa, necessary precautions were taken to ensure that the mortar was not visible from outside.

It was proposed to extend the restoration work under progress to the northwestern quadrant after reaching *medhi* portion in the northeastern quadrant. Likewise, the dismantling and restoration of the northeastern part of the main platform, over which the main stupa raised, was also started and the same is under progress. The basal courses of the platform were found directly resting over the bed-rock. Mud was found originally used as binding medium to hold the random rubble-stones and semi-dressed stones together.

82. BUDDHIST MONUMENTS, SONARI, DISTRICT RAISEN.— The fallen or bulged-out enclosure walls were restored, in dry stone masonry, out of the stones available at the site.

83. FORT, DHAMONI, DISTRICT SAGAR.— The bulged, damaged and missing arches and walls of the cells of the guardroom-complex of Dhamoni Fort were restored in plumb and alignment in lime-mortar and the decayed roof terrace made watertightened by replacing the old one with a fresh layer of lime-concrete.

84. TOMB AND MOSQUE OF BALJATISHAH, DHAMONI, DISTRICT SAGAR.— The decayed and damaged roof concrete of the mosque was replaced with fresh lime-concrete and made watertight. The arched openings of the mosque were provided with welded wiremesh door shutters in angle iron frames. The damaged and decayed flag-stone flooring of the platform of the mosque and tomb of

Baljatishah was replaced with chisel-dressed flag-stones in lime-concrete base. The work is in progress.

85. FORT, KHIMLASA, DISTRICT SAGAR.— The damaged and missing portions of the fort-wall and its battlements were restored in stone masonry in lime-mortar.

86. BADAL MAHAL, FORT, RAHATGARH, DISTRICT SAGAR.— The damaged and missing stone brackets, *chhajjas* and arches were restored as per the original.

87. FORT, RAHATGARH, DISTRICT SAGAR.— Dumped and settled debris of fallen structures of the palace was removed from the complex. The damaged and missing walls were restored in R.R. stone masonry in lime-mortar. The stone arches and the *chhajjas,* either missing or damaged, were conserved matching the original.

88. ANCIENT SITE, BHARHUT, DISTRICT SATNA.— The main stupa, excavated by Sir Alexander Cunningham was enclosed with G.I. barbed-wire fencing on angle iron posts to check encroachment and vandalism.

89. SIVA TEMPLE, BHUMARA, DISTRICT SATNA.— The area around the temple was enclosed with G.I. barbed-wire fencing on angle iron posts. The damaged stone flooring around the sanctum were provided with fine chisel-dressed cut-stone on concrete base. The remaining items of works are in progress.

90. MONUMENTS, AMARKANTAK, DISTRICT SHAHDOL.— Desilting of the ancient tank located within the complex was undertaken. The restoration of bulged, damaged and missing offsets of the tank were taken out and replaced with chisel-dressed stones in plumb and alignment. The platform of the Juhala Temple was also carried out. Other temples were watertightened to stop leakage.

91. GADARMAL TEMPLE, BADOH PATHARI, DISTRICT VIDHISA.— The fallen architectural members of the temple, which were partly buried were retrieved and stacked properly and the adjoining open area was levelled. Two large-sized lions originally placed on the either side of the *tor ana* gateway, broken in three parts were mended, using stainless steel rods, polymer adhesive and stone dust.

92. BAJARAMATH, GYARASPUR, DISTRICT VIDHISA.— The damaged and missing platform of Bajaramath Temple was taken up for restoration with chisel-dressed veneering stone. The missing flag-stone flooring, originally provided on the platform, were restored with fine chisel-dressed cut stone flooring on concrete base.

93. BUDDHIST STUPA, GYARASPUR, DISTRICT VIDHISA.— The bulged and damaged stupa was taken up for restoration in plumb and alignment upto the available height. The restoration of damaged and missing *ayaka* projections to accommodate the Buddha images on the cardinal directions of the stupa were also taken up in ashlar stone masonry matching the original. The work is in progress.

94. HINDOLA TORAN, GYARASPUR, DISTRICT VIDHISA.— The area around Hindola Toran complex was enclosed with stone masonry dwarf-wall mounted with M.S. grill. On the rear side, where remains of a massive wall was exposed during excavation for laying the foundation, instead of

dwarf-wall, G.I. barbed-wire fencing on angle iron posts was provided so that the area could be extended after extensive exploration and a dwarf-wall was finally constructed to protect the archaeological area.

95. CAVES, UDAIGIRI, DISTRICT VIDISHA.— Foreground of Caves 3 and 4 were provided with stone pitching to avoid soil erosion and improve the frontage. The area between Caves 6 and 17 was also enclosed with stone masonry dwarf-wall mounted with M.S. grill. The area between Caves 19 and 17 was enclosed with G.I. barbed-wire fencing on angle iron posts.

96. NEELAKANTHESVARA TEMPLE, UDAIPUR, DISTRICT VIDISHA.— The cracked, damaged and settled cut-stone original flag-stones of the platform around the temple was taken up for replacement with fresh fine chisel-dressed cut-stone slabs maintaining fine joints on concrete base to check the ingress of rain-water into the foundation of the temple. The work is in progress.

97. BIJAMANDAL, VIDISHA, DISTRICT VIDISHA.— The heaps of structural debris around Bijamandal was excavated mechanically from the north, south and east and filled in the depressions on the rear side. The architectural members and usable stones were stacked properly for their use in restoration of the temple. The removal of the debris and levelling of the area has considerably improved the frontage to undertake environmental development. The compound-wall on the east was also provided with M.S.grill in view of security of the loose sculptures housed in the sculptureshed.

98. CHAUBARA DERA 2, UN, DISTRICT WEST NIMAR.— Restoration of damaged and missing veneering stones of the platform of the monument was taken up with stones matching the original. The work is in progress.

BHUBANESWAR CIRCLE

Madhya Pradesh

99. ANDAL DEUL, KHAROD, DISTRICT BILASPUR.— The conservation of brick temple popularly known as Andal Deul was taken up and missing front facade was restored as per the original.

100. BHIMA KICHAKA TEMPLE, MALHAR, DISTRICT BILASPUR.— Around the Bhima Kichaka Temple a stone paved floor was provided.

101. KANTI DEUL, RATANPUR, DISTRICT BILASPUR.— In continuation of the previous year's work *{1994-95,* p. 114), the reconstruction of octagonal *sikhara* was in progress. A new stone *kalasa* was also installed. Besides, flight of steps and the apron around the monument were constructed. The restoration of the temple was completed with the installation of *Siva-linga* in the sanctum.

Orissa

102. EXCAVATED REMAINS, BARABATI FORT, DISTRICT CUTTACK.— The exposed compound-wall of Barabati Fort on the southern side raised to a considerable height and the work is in progress.

Repair to the watchtower on top of the mound was attended to. The work is in progress.

The missing part of excavated structural remains were provided with dressed stones. The work is in progress.

103. SIMHANATHA MAHADEVA TEMPLE, GOPINATHPUR, DISTRICT CUTTACK.— The undulated, dilapidated stone paved courtyard of Simhanatha Temple was taken up for repairs and the work is in progress.

104. TEMPLES AT MAHENDRAGIRI, DISTRICT GAJAPATI.— The approach pathway connecting Yudhishthira Temple to Bhima Temple on the summit of the mountain was undertaken and the work is in progress.

105. JAGANNATHA TEMPLE, JAJPUR, DISTRICT JAJPUR.— The low lying surrounding of Jagannatha Temple was raised above 2 m and levelled with stone pavement to arrest water stagnation during the rainy-season. The work is in progress.

106. TRILOCHANESVARA TEMPLE, JAJPUR, DISTRICT JAJPUR.— The undulated and sunken stone paved courtyard was taken up for repairs. The southern portion was dismantled and resetting work is in progress.

107. EXCAVATED BUDDHIST MONASTERY, UDAYAGIRJ, DISTRICT JAJPUR.—The exposed Buddhist stupa was conserved and watertightened (pl.LXV). Four seated colossal figures of *dhyani* Buddhas in niches are provided with RCC sunshed to save them from disfigurement by miscreants and anti-socials.

108. JAINA CAVES, UDAYAGIRI-KHANDAGIRI NEAR BHUBANESWAR, DISTRICT KHURDA.— The construction of new laterite stone pavement in front of the main entrance of Udayagiri hill including new steps made of sandstone blocks is in progress to facilitate frequent movement of tourists/ visitors and development-cum-beautification of the environs of monument. The construction of cement-concrete pathway connecting Hathigumpha to Ganesagumpha and apsidal structure on summit was completed.

109. LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT KHURDA.— In continuation of the previous year's work *(1994-95,* p. 116), renewing and resetting laterite/sandstone pavement on the southern side of the complex was taken up. Stone pavement around the Ramalingesvara Shrine in the southern corner of the complex was relaid.

The dilapidated roof of Mayur Vihar (south-east corner of the complex) was restored.

Dilapidated stone shrine of Lavanesvara Temple was taken up for dismantling and it is in progress.

Similarly, repairing and conservation of Satyanarayana Shrine was attended to by watertightening the laterite stone wall. The work is in progress.

110. RAMESVARA TEMPLE, BHUBANESWAR, DISTRICT KHURDA.— The renovation of damaged undulated stone pavement around the monument was in progress. The watertightening of the laterite stone walls of the well has been completed.

The sanctum of excavated Buddhist monastery was provided with RCC roof.

111. RADHAMOHANA BRICK TEMPLE, HARIPURGARH, DISTRICT MAYURBHANJ.— The damaged brick temple of Radhamohana was exposed. Conservation of the temple was attended to by replacing the newly dressed brick courses and resetting out-of-plumb wall structures. Floors were also restored. Construction of a low height enclosure-wall around the temple was completed in three directions except the east (pl.LXVI).

112. JAGANNATHA TEMPLE, PURI, DISTRICT PURL— In continuation of the previous year's work {*1994-95,* p. 116), the deplastering of north (pl.LXVII), west, south and east sides below the *bisama* level of the main temple was completed. The deplastering of *amala* of the *vimana* was completed as per the recommendation of the Technical Expert Committee.

The miniature shrine *(anga sikhara)* below the *gajasardula* of eastern *rahapaga* of the main temple was dismantled due to its dilapidation, damage and dislodgement and reset the same as per archaeological norms.

As per the recommendation of the Technical Expert Committee, stainless pillars around the space between the *bisama* and the *amalaka* were colour matched..

The dilapidated and out-of-plumb architectural members of the southeastern *kanikapaga* on the superstructure were restored and conserved as per original. The out-of-plumb and badly damaged/dislodged miniature *sikhara* of south-east and south-west *anurahapaga* were dismantled and reset.

The deplastered *mukha-mandapa* of Nilamadhava Shrine within Jagannatha Temple was in bad state of preservation. It was restored by removing the existing old roof and casting the new one.

CALCUTTA CIRCLE

West Bengal

113. JOR-BANGLA TEMPLE, BISHNUPUR, DISTRICT BANKURA.— Lime-concreting over the verandah on the rear side and repairing of apron around the monument were completed. Special brickwork was also done on the main entrance.

114. MADANAMOHANA TEMPLE, BISHNUPUR, DISTRICT BANKURA.— The *mukha-mandapa* of the missing portion of the vaulted roof was restored with special sized bricks matching the original (pl.LXVIII). The restoration of ornamental works on the cornice of the *chala* portion was also carried out.

115. MALLESVARA TEMPLE, BISHNUPUR, DISTRICT BANKURA.— The monument was provided with a stone masonry compound-wall with M.S. grill fittings to match the original structure. The work of lime-plastering was carried out after raking out the decayed mortars from inner and outer surfaces of the temple and brick apron was provided. The crowning portions of the temple were watertightened and the saline affected portions restored with proper underpinning.

116. SHYAMARAI TEMPLE, BISHNUPUR, DISTRICT BANKURA.— Damaged terracotta panels of the four *sikharas* of the temple were restored and lime terracing to the main roof was attended to as per original.

117. SAILESVARA TEMPLE, DIHAR, DISTRICT BANKURA.— Stone masonry work for the missing portion on the frontal facade of the temple was done with lime-sand plaster.

118. SANRESVARA TEMPLE, DIHAR, DISTRICT BANKURA.— Stone masonry work for the missing portion on the frontal facade of the temple and on the plinth was carried out with lime-sand plaster.

119. GOPALJI TEMPLE, KALNA, DISTRICT BARDHAMAN.— The damaged floor in front of the sanctum was relaid and the temple restored with underpinning brickwork on the exterior of the northern facade of the temple and subsequent replastering. The walls of the kitchen room were also painted.

120. HUNDRED AND EIGHT SIVA TEMPLES, KALNA, DISTRICT BARDHAMAN.— Lime-concrete flooring around the temples of the inner circle was completed and M.S. railings provided around it for horticultural operations.

121. LALJI TEMPLE, KALNA, DISTRICT BARDHAMAN.— Repairing of the *sikhara* was done with brickwork and the walls of the adjacent rooms in the complex were plastered. The flooring of the courtyard was raised to prevent water stagnation at the site by lime-concreting the terrace.

122. TOMB OF BAHARAM SAKKA, SHER AFGAN AND NAWAB QUTB-UD-DIN, DISTRICT BARDHAMAN.— Replastering in composite mortar was done to the walls and the floor was relaid after raking out the old and pulverized mortars.

123. TEMPLE OF BASULU AND THE MOUND (TOGETHER WITH FOURTEEN OTHER TEMPLES NEAR THEM CONTAINING SIVA LINGAS), NANOOR, DISTRICT BIRBHUM.— The damaged rear wall of the main temple was restored and the flooring inside the temple relaid as per original.

124. MAHARSHI BHAVAN (JORASANKO THAKURBARI), CALCUTTA.— Though not protected by the Survey, the conservation work of the Maharshi Bhavan was carried out. The roofs were watertightened by lime-concreting the terrace and the worn-out beams and *burgahs* were replaced. Underpinning brickwork and re-plastering of the damaged walls and ceilings were done in composite mortar to match the original. Dry distempering to the inner walls and water repellant to the outer walls were applied for better preservation of the structure. Door and windows were painted as per original.

125. METCALFE HALL, CALCUTTA.— The roof of the frontal portico (pl.LXIX) was watertightened after removal of old tarphelt on it and the worn-out beams and *burgahs* were replaced by brick masonry, plastering and painting.

126. COOCHBEHAR PALACE, COOCHBEHAR DISTRICT COOCHBEHAR.— The roof is relaid with lime-concrete after raking out the dead mortar and coating it by a damp proof material. Replastering of the parapet-walls, staircase and upper most hall have also been done by raking out the dead plaster.

127. HANSESVARI TEMPLE, BANSBERIA, DISTRICT HOOGHLY.— Replastering in composite mortar was done to the walls matching the original. After scrapping moss and lichen from the old surface, the exterior surface was treated with water repellant paint of matching colour.

128. BRINDABANCHANDRA THAKUR'S MATH, GUPTIPARA, DISTRICT HOOGHLY.— Brickwork with necessary pointing and plastering to the walls of western, northern and eastern sides and lime terracing over the roof were executed in the *garbhagriha* and in the room on the eastern side. **Other** .ninor structural repairs and woodwork were also attended to. Replastering of the walls on the rear side of the Krishna Chandra Temple was also attended to, in composite mortar as per the original along with the lime-concrete relaying of floor in the courtyard.

129. DANISH CEMETERY, SERAMPORE, DISTRICT HOOGHLY.— Underpinning brickwork and plastering in composite mortar was carried out for restoration of the damaged tombs in the complex.

130. ADINA MOSQUE, ADINA, DISTRICT MALDA.— Plain brick masonry work with *lime-surkhi* mortar matching the original was done for restoration of the damaged walls and arches on the southern side of the mosque.

131. BAISGAZI WALL, GAUR, DISTRICT MALDA.— The massive wall was strenthened by providing a retaining wall and the surrounding area was levelled. Besides some cracks and voids on the top of the wall were duly filled in to avoid water seepage.

132. BARADUARY MOSQUE, GAUR, DISTRICT MALDA.— The damaged portion of the entrance gate was restored by underpinning brickwork and pointing.

133. CHAMKATTI MOSQUE, GAUR, DISTRICT MALDA.— Brick masonry work was carried out for restoration of the damaged arches, pillars, walls and other ornamental works.

134. DAKHIL DARWAJA, GAUR, DISTRICT MALDA.— Ornamental brick masonry work was done on the frontal facade in lime-sand mortar to match the original.

135. KOTWALI GATE, GAUR, DISTRICT MALDA.— Some damaged portions on both sides of the brick-built gateway were restored to match the original.

136. LOTTAN MASJID, GAUR, DISTRICT MALDA.— Damaged octagonal pillar of the mosque was restored with proper brickwork and pointing. Ornamental brickwork was carried out with *lime-surkhi* mortar to match the original fabric and content of the structure.

137. TANTIPARA MASJID, GAUR, DISTRICT MALDA.— One of the missing corner pillars was partly restored with brick masonry work in *lime-surkhi* mortar.

138. RESIDENCY CEMETERY, BABULBONA, DISTRICT MURSHIDABAD.— The damaged tombs were repaired by underpinning and replastering.

139. CHARBANGLA GROUP OF FOUR SIVA TEMPLES, BARANAGAR, DISTRICT MURSHIDABAD.— The roof of the northern temple and portion of the roof of western temple were watertightened by lime concreting the terrace.

140. HAZARDUARI PALACE AND IMAMBARA, MURSHIDABAD, DISTRICT MURSHIDABAD.— The damaged roof on the eastern half of Imambara was restored by lime-concreting the terrace, replacing the worn-out beams, and *burgahs* and spreading of the tiles. The inner walls of the rooms of eastern and northern portions were replastered after removing the dead mortars. The damaged wooden arches of the *medina* in the complex and an ornamental framework were also restored matching the original.

141. TOMB AND MOSQUE OF MURSHID QULI KHAN, SABJI KATRA, DISTRICT MURSHIDABAD.—The damaged upper portions of the *minars* on both sides were restored by underpinning, recess pointing and veneering.

142. BALLALLDHIPI, BAMANPUICUH, DISTRICT NADIA.— The exposed central structural remains were restored by underpinning brickwork on its southern side along with subsequent pointing. The exposed floor at the top is relaid as per the original.

Sikkim

143. REBDENTSE SITE OF ANCIEKT CAPITAL OF SIKKIM, DISTRICT WEST SIKKIM.— Strengthening of ashlar masonry work was done by cleaning the wild vegetational growths.

CHANDIGARH CIRCLE

Haryana

144. KOSMINARS, HODAL AND PALWAL, DISTRICT FARIDABAD.— The pulverized masonry work of the *minars* were repaired by underpinning, watertightening and plastering.

145. LAT-KI-MASJID, FATEIMBAD, DISTRICT FATEHABAD.— The dislodged flooring of the courtyard of the Masjid were reset with *tildlakauri* brick.

146. BAOLI GHAUS ALI KHA:N, FARRUKHNAGAR, DISTRICT GURGAON.— Disturbed apron and roof of Baoli was repaired by underpinning, watertightening and pointing etc. at the different portions.

147. ANCIENT STUPA, AGROIM, DISTRICT HISSAR.— The excavated remains of the stupa were conserved by watertightening, underpinning and pointing etc. as per the original.

148. BARSI GATE, HANSI, DISTRICT HISSAR.— The damaged old masonry of the gate was restored by watertightening, underpinning, pointing and stitching joints as per the original.

149. PRITHVI RAJ CHAUHAN'S FORT, HANSI, DISTRICT HISSAR.— The damaged drainage system was restored and dilapidated and fallen retaining wall was reconstructed.

150. FEROZSHAH PALACE, HISSAR, DISTRICT HISSAR.— The work of reproduction of pathway of the palace was completed by RH. masonry work as per the original.

151. MUGHAL SARAI, GHARMNDA, DISTRICT KARNAL.— The dilapidated northern gate of the Sarai was restored.

152. KHWAJA KHIZIR'S TOMP, THANESAR, DISTRICT KURUKSHETRA.— The worn-out apron and collapsed retaining wall has been restored by underpinning, watertightening and pointing etc.

153. RAJA HARSH-KA-TILA, THANESAR, DISTRICT KURUKSHETRA.— Excavated remains were watertightened and pointed.

154. SHEIKH CHILLI TOMB, THANESAR, DISTRICT KURUKSHETRA.— Restoration of dismantled south corner *burji* and damaged cells of Madrasa have been carried out.

Punjab

155. FORT, BATHINDA, DISTRICT BATHINDA.— The work of underpinning, watertightening and restoration of drains for safeguarding the monument have been completed as per original pattern.

156. DAKHNI SARAI, DAKHNI, DISTRICT JALANDHAR.— The damaged and dismantled cells and gate of the Sarai were repaired as per original pattern.

157. MUGHAL BRIDGE, DAKHNI, DISTRICT JALANDHAR.— The Mughal bridge was repaired by underpinning, watertightening and filling the gaps as per original pattern.

158. NOORMAHAL SARAI, NOORMAHAL, DISTRICT JALANDHAR.— Dismantled gate and disturbed masonry were repaired and restored matching the original. Restoration of the floor and the roof was completed by concreting and watertightening.

159. ANCIENT SITE, RUPNAGAR, DISTRICT RUPNAGAR.— The disturbed masonry were repaired with *tile/lakhauri* brick, sand filling in rooms and concreting, laying mud-plaster over the roof of Nalagarh Kothi as per original pattern.

DELHI CIRCLE

Delhi

160. JAMA-MASJID, DELHI.— The worn-out and decayed red sandstone flooring was carefully dismantled and simultaneously 100 mm thick red sandstone flooring was laid in conformity with the original pattern.

161. MAGAZINE GATE, DELHI.— Structural repairs by way of *lakhauri* brick masonry, plastering with composite mortar, stitching and grouting of cracks, providing and fixing of M.S. gates were carried out.

162. RED FORT, DELHI.— The old decayed lime-plaster was dismantled from the exteriors of Rang Mahal and replastered with composite mortar laminated with *chunam* plaster. Structural repairs by way of underpinning with *lakhauri* brick masonry were undertaken at Asad Burj.

Lakhauri brick masonry and plastering with composite mortar along with providing and fixing of red sandstone flooring around tank in front of Rang Mahal were carried out. Red sandstone flooring was provided on pathway in-between Naubat Khana and Diwan-i-Am.

Structural repairs of the colonial building after taking over its possession from the Army for establishment of Swatantrata Sangrama Sangrahalaya was taken up. The museum was inaugurated by the Hon'ble Prime Minister of India on October 2, 1995. The repairs include laying of red

sandstone and Kota stone flooring, plastering, laying terrace concrete, stitching and grouting of cracks, providing and fixing of red stone *chhajja* and false ceiling.

163. SALIMGARH, DELHI.— Structural repairs in the barracks were carried out, which include laying concrete flooring, plastering, random rubble-masonry, pointing, providing and fixing false ceiling etc. in order to make them ready for the Swadhinata Senani Smaraka which was inaugurated on 26 November, 1995 by the Hon'ble President of India.

164. TRIPOLIA GATE, DELHI.— The damaged, worn-out and missing red sandstone veneering along with ornamental plaster has been restored as per the original pattern.

165. AFSARWALA MOSQUE AND TOMB, NEW DELHI.— Random rubble and *lakhauri* brick masonry were strengthened by pointing of open joints and laying lime-cement-concrete on terrace.

166. ALAUD-DIN'S TOMB AND COLLEGE, NEW DELHI.— Underpinning with random rubble-masonry and pointing of open joints with composite mortar was undertaken and completed. In addition, lime-cement-concrete flooring was laid in order to prevent seepage of rain-water into the foundation and growth of unwanted wild vegetation.

167. BEGAMPURI MASJID, NEW DELHI.— The work of underpinning with random rubble-masonry and pointing of joints with composite mortar was completed.

168. BUHLUL LODI'S TOMB, NEW DELHI.— Pointing of joints of random rubble-masonry, with composite mortar, laying lime-cement-concrete flooring and fixing of red sandstone *chhajja* in accordance with the original pattern were undertaken.

169. BU-HALIMA'S TOMB, NEW DELHI.— Repairs to the monument were carried out by way of random rubble-masonry, *lakhauri* brick masonry, pointing with composite mortar and laying of lime-cement-concrete on the terrace to check percolation of water.

170. KHAIRUL-MANAZIL MOSQUE, NEW DELHI.— Structural repairs by way of plastering of random rubble-masonry and pointing of open joints with composite mortar were undertaken.

171. PURANA QILA, NEW DELHI.— The work of random rubble-masonry, plastering with composite mortar and laying of lime-cement-concrete flooring was undertaken.

172. QUTB MINAR, NEW DELHI.— Besides the works of grouting and pointing of joints, the damaged and crushed veneer-stones were replaced with new ones in conformity with the original pattern.

173. QUWWATUL ISLAM MASJID, NEW DELHI.— Old and decayed veener-stones were replaced and repairs to the monument were attended to by grouting and pointing of joints to stop seepage of water.

174. SAFDARJUNG TOMB, NEW DELHI.— The work underpinning with random rubble-masonry, pointing and plastering with composite mortar, lamination with *chunam* was carried out.

175. SHER MANDAL, NEW DELHI.— The missing and decayed stones of *chhajja* were replaced by new stones in accordance with the original pattern.

176. SHER SHAH GATE, NEW DELHI.— Structural repairs of the monument consisting of random rubble-masonry and pointing of open joints with composite mortar were completed.

177. UGRASEN-KI-BAOLI, NEW DELHI.— The random rubble-masonry was strengthened by plastering with composite mortar and pointing of open joints.

GUWAHATI CIRCLE

Assam

178. CACHARI RUINS, KHASPUR, DISTRICT CACHAR.— The dead plaster on the walls was replaced with fresh ones by attending to pointing and plastering. Brick-on-edge with concrete base was laid in the pathway leading to Rana Chandi Temple 2 at Bara Duari.

179. SIVA TEMPLE, NEGHERITING, DISTRICT GOLAGHAT.— The approach pathway was restored including brick compound-wall.

180. AHOM RAJA'S PALACE, GARHGOAN, DISTRICT SIBSAGAR.— The dead plaster wherever necessary on the walls of each storey was replaced with fresh one and the roof was watertightened. The ground towards north was levelled by earth filling.

181. DEVIDOL, GAURISAGAR, DISTRICT SIBSAGAR.— The dead plaster on the exterior of *sikhara* was replaced with combination of fresh lime-and *surkhi-plaster.* The plants have been uprooted and gaps were filled in by grouting. The low lying area behind the monument was filled with earth.

182. KARENGGHAR, JOYSAGAR, DISTRICT SIBSAGAR.— The open terrace on the first floor was repaired towards north by replacing the missing bricks and filling with brick and lime-concrete combination.

183. VISHNUDOL, JOYSAGAR, DISTRICT SIBSAGAR.— Plinth protection around the temple was laid with concrete-based brick apron. The wall portion was strengthened by pointing and plastering wherever missing. The old brick pathway was restored.

184. SIBDOL, SIBSAGAR, DISTRICT SIBSAGAR.— The fallen portion of *mukha-mandapa* was restored with fresh lime-concrete application.

Manipur

185. VISHNU TEMPLE, BISHNUPUR, DISTRICT BISHNUPUR.— The dead plaster on the wall was replaced by fresh one. The damaged portion *of sikhara* was restored.

Tripura

186. CHATURDASA DEVATA TEMPLE, UDAIPUR, DISTRICT SOUTH TRIPURA.— Plinth protection was provided around the temple by laying brick apron and restoring the ancient compound-wall in the north-west corner.

187. ROCK-CUT SCULPTURE, UNAKOTI, DISTRICT NORTH TRIPURA.— The cracks developed on the rock-cut sculptures were filled in with lime-mortar and flooring below the sculptures was laid. The flooring of temporary thatched sculptureshed has been laid with cement-concrete.

JAIPUR

CIRCLE

Rajasthan

188. MARBLE PAVILIONS AND BALUSTRADE ON THE ANASAGAR BANDH AND THE MARBLE HAMMAM BEHIND THE ANASAGAR BANDH, AJMER, DISTRICT AJMER.— Dismantling and relaying concrete of platform and retaining wall were done besides dismantling and replastering the walls. Lime-cement-concrete and R.R. stone masonry was provided to the enclosure-wall outside *baradah.* Iron gates to prevent entry of animals, etc., were also fixed. Dismantling of decayed and cracked concrete of the Hammam and relaying the same were also attended to.

189. ANCIENT SITE, BHANGARH, DISTRICT ALWAR.— During the period under review, R.R.stone masonry was provided in the pathway from Bazar to Gopinath Gate. Burried structures were exposed by scientific digging and removal of debris from southern side bazar (Shop Nos. 21 to 60), north side bazar (Shop Nos. 51 to 68) and underpinning have been done to the exposed structures with R.R. stone masonry. Exposed structures were pointed besides replastering the walls wherever missing and decayed. Lime-cement-concrete flooring have also been replaced in Shop Nos. 51 to 68 of north side bazar. Exposing the structures near Gopinath Gate and construction of pathway were also undertaken. Buried fortification wall in the south side has been exposed by removing fallen debris and restoration of the fallen portions with R.R. stone masonry in lime-cement-mortar was also done.

190. BAYANA FORT, BAYANA, DISTRICT BHARATPUR.— Pathway from base of hill upto the first gate of fort with R.R. masonry in lime-cement-mortar was provided.

191. USHA MANDIR, BAYANA, DISTRICT BHARATPUR.— Resetting of sandstone jambs of main gate has been done. Underpinning the wall with R.R. stone masonry and providing low level wall in front of mosque to prevent entry of drain water has been done. Fallen iron grill has been refixed and main wooden door repaired. Underpinning of the wall in front of the side verandah of the temple has been done and sunken stone flooring and steps at the entrance of the temple have been reset.

192. FORT, BHARATPUR, DISTRICT BHARATPUR.— Earth has been refilled in some of the portions on the back of moat wall which had settled down in heavy rains. Underpinning with L.B. work in Bastion No. 10 and with R.R. stone masonry in fortification wall have been undertaken and the work is in progress.

193. DIG PALACE, DIG, DISTRICT BHARATPUR.— Fallen portion of the eastern side boundary-wall of Katcha Bagh has been restored with R.R. stone masonry work in lime-cement-mortar. Stone pitching along the wall has also been provided.

Decayed portion of plastering including ornamental mouldings of Hardeo Bhawan has been replaced with fresh lime-cement-plaster and floor concrete have been relayed wherever decayed.

Outer walls of Saradkhana, Gopal Bhavan have been underpinned with R.R stone masonry and were replastered matching the original. Decayed flooring of the rooms have been relayed with lime-concrete and stone flooring. Broken, sunken and missing stone flooring in front of the Gopal Bhavan has also been relayed.

Replacement of decayed plastering of walls and floor concrete of rooms on the eastern side of Singh Pol Gate is in progress.

194. BAORI, ABANERI, DISTRICT DAUSA.— During the period under review, the works of replacing the decayed and peeled off plastering of the walls, relaying lime-cement-concrete flooring and providing iron grill to the openings for safety of the sculptures and railing around the Baori for safety of visitors were attended to.

195. HATNER FORT, DISTRICT HANUMANGARH.— The pits formed by erosion due to rain were filled up with earth . Repairs to the part of Bastion No. 10 were carried out by underpinning the old *lakhauri* brick masonry using ancient bricks with lime-cement brick zeera mortar to match the original.

196. JAMI MASJID, AMBER, DISTRICT JAIPUR.— Stone flooring wherever decayed and missing was provided. Replastering has been done to the decayed and peeled off plastering of the walls.

197. LAXMI-NARAIN TEMPLE, AMBER, DISTRICT JAIPUR.— Low level wall of R.R. stone masonry and stone pillars on the front side of temple were provided to prevent encroachment of cells, etc. Roughly dressed stone flooring was provided to the courtyard with lime-cement-mortar.

198. JAISALMER FORT, DISTRICT JAISALMER.— Restoration/reconstruction of collapsed portion of lower fortification wall with ashlar stone masonry of duly dressed old and new stones was carried out.

199. BUDDHIST CAVES, KOLVI, DISTRICT JHALAWAR.— Parapet with R.R stone masonry wherever missing along the pathway in front of the caves was restored.

200. FORT, RANTHAMBHOR, DISTRICT SAWAI MADHOPUR.— R.R. stone masonry approach road from Padamla Talab towards Ganesa Temple was provided. R.R. stone masonry enclosure-wall of Padamla Talab wherever missing was reconstructed. The top of the same was watertightened. Stone pathway was provided from Dargah towards Badal Mahal with R.R. stone masonry. The work is in progress. Restoration of decayed and bulged fortification wall from Naulakha Gate to Andheri Gate was carried out by dismantling and reconstructing R.R. masonry. The work is in progress.

201. FORT, KUMBHALGARH, DISTRICT RAJSAMAND.— Stone pathway in R.R. stone masonry with lime-cement-mortar from Rampol to Bhairopol and from Bhairopol to Nimbhupol was provided, after cutting and digging rocks and preparation of subgrade by cutting hard soil.

Repairs to the broken and missing doors and windows and fixing of glasspanes wherever broken in Badal Mahal, were carried out as per the original.

Dismantled, dislodged and loose R.R. stone masonry wall of the Ganesa Temple and adjoining area was repaired and reconstructed in lime-cement-mortar. Stone pathway was provided from Rampol to Vedi Temple and Ganesa Temple to Laxmi Narain Temple.

202. SAS BAHU TEMPLE, NAGDA, DISTRICT UDAIPUR.— Repairs to the bulged brick *sikhara* of Bahu Temple have been carried out by underpinning and reconstructing, matching the original.

LUCKNOW CIRCLE

Uttar Pradesh

203. EXCAVATED SITE, KAUSAMBI, DISTRICT ALLAHABAD. — Structural repairs like underpinning, pointing and watertightening are in progress to strengthen the exposed Ghositarama Monastery.

204. EXCAVATED SITE AT SRINGAVERAPURA, DISTRICT ALLAHABAD.— Drainage system was provided around the excavated site properly.

205. KYDGANJ CEMETERY, DISTRICT ALLAHABAD.— Barbed-wire fencing was provided to the western side of Kydganj Cemetery. The work of repairing the graves is in progress.

206. EXCAVATED SITE AT SRAVASTI (SAHET), DISTRICT BAHRAICH.— The structural repairs like underpinning, watertightening, pointing were completed at the Temple Nos. 1,5 and 19 of Sahet.

207. KALINJAR FORT, DISTRICT BANDA.— The fallen southern side fort-wall was reconstructed in accordance with the original pattern.

The repairing work of northern wall is in progress.

The structural repairs to the southern side wall of Koti Tirath staircases are in progress. The cracks were stitched and plastering was done in the floor of the tank.

The damaged roof of the Raja Aman Singh palace is being replaced with new one as per the original. The work is in progress.

The repairing work like pointing of the southern side wall of the Buddhi Buddha Tank is in progress. The fallen staircases were also restored.

208. BANI KHANAM'S TOMB, DISTRICT FAIZABAD.— Old and dead lime-plaster of the ground floor was removed and replastered as per the original.

The conservation works of the vaulted ceiling walls and moulded plaster are in progress.

209. BAHU BEGUM, DISTRICT FAIZABAD.— The structural repairs to the main entrance gate and the adjoining compound-wall are in progress.

210. GULAB BARI, DISTRICT FAIZABAD.— The dead and decayed plaster of the mosque and adjoining compound-wall was removed and a fresh lime-plaster was relaid covering the moulded and geometrical designs.

At *baradari,* old and dead plaster was removed and replastered as per the original. Wide and deep cracks were reopened and grouted besides underpinning, wherever necessary. Repairing work of the pathway was also done.

The repairing work of the main entrance is in progress.

211. JHANSI FORT, DISTRICT JHANSI.— The resetting work of collapsed portion of the northern side arched cells was completed as per the original.

The repairing works like pointing, underpinning, watertightening of the structures of Amod Garden with the help of combination material are in progress.

The Structural repairs in *baradari* like underpinning, plastering with *lakhauri* brick and lime-plaster are in progress.

The old Raja Gangadhar Rao-ki-Chhatri, made of bricks and plastered with lime was replaced with the new one.

212. BRICK TEMPLE AT NIBIAKHERA, DISTRICT KANPUR.— Barbed-wire fencing was provided.

213. KATCHERI CEMETERY, DISTRICT KANPUR.— The structural repairs like pointing, plastering of the graves at Katcheri Cemetery were completed.

214. VARAHA TEMPLE, DEOGARH, DISTRICT LALITPUR.— The construction work of boundary wall with stone masonry around the temple was completed.

215. TALBEHAT FORT, DISTRICT LALITPUR.— Structural repairs and fixing of iron gate were completed at Talbehat Fort.

216. KURAIVAVEER TEMPLE, KUCHDON, DISTRICT LALITPUR.— The construction work of boundary-wall is in progress.

217. AMJAD ALI SHAH'S MAUSOLEUM, DISTRICT LUCKNOW.— The facade of the main mausoleum was repaired including the cornice, miniature domes, etc.

Big-sized middle arches, side pillars were repaired after raking out dead and decayed plaster and reproduced with rich floral design on the arches. Reconstruction of swelled out and damaged staircases was also completed.

218. ASAF-UD-DAULA'S IMAMBARA, DISTRICT LUCKNOW.— The middle floor of the main chamber of the famous Baoli of Bara Imambara complex and the adjoining side chambers were replastered with combination mortar as per the original after raking out the dead plaster.

The work of providing/fixing of pinnacles over miniature domes of the Imambara complex itself is in progress.

219. ASAFI MOSQUE, DISTRICT LUCKNOW.— After removing the dead, decayed and bulged-out lime-plaster, a fresh lime-plaster was laid in the southern wing of Asafi Mosque as per original. The work of underpinning was also commenced wherever required.

220. OLD PALACE AT DILKUSHA, DISTRICT LUCKNOW.— The construction work of a dwarf-wall, providing ornamental iron grill over it towards the eastern side of Dilkusha was completed.

221. DIANUT-UD-DAULA'S KARBALA, DISTRICT LUCKNOW.— The dead and decayed lime-plaster was removed and a fresh lime-plaster was relaid in the facade of the monument in combination mortar.

An apron around the base of the monument was also provided.

222. MUSHEERZADI'S TOMB, DISTRICT LUCKNOW.— Repairs to the basement, doors, windows were carried out in combination mortar.

223. NASIRUDDIN HAIDER'S KARBALA, DISTRICT LUCKNOW.— After removing the peeled off plaster, a fresh lime-plaster was laid in the northern facade maintaining its originality. An apron was provided to the basement of the monument.

224. RESIDENCY BUILDING, DISTRICT LUCKNOW.— In continuation of the earlier *(1993-94,* p. 180) work, wooden frames (plywood and laminated boards) with glasses were provided in the showcases of east, west and north sides galleries of Model Room for keeping old Lithograph/Photographs in proper manner for safety and security.

The compound-wall of the Residency complex was repaired and low wall was raised (wherever missing). To prevent unauthorized entries an iron gate was also provided.

The old, decayed wooden beams of Baillie Guard Main Gate were replaced with the new ones. An apron for plinth protection was provided. The work of restoration of damaged floor, wall, door, etc., was carried out as per the original. Both the sides of the gate were fenced with barbed-wire to check unauthorized entries to the monument. The work of pre-mixing of top coat of road/pathway from the main gate to the model room is in progress. The work of providing flooring in the Treasury Building is in progress.

225. SHAHNAJAF TOMB, DISTRICT LUCKNOW.— Stitching of cracks and providing lime-plaster coating to the inner side of the main tomb of Shahnajaf Imambara as per the original were carried out.

226. TOMB OF SADAAT ALI KHAN, DISTRICT LUCKNOW.— The chemical cleaning of the monument with the solution of caustic soda and water was carried out.

The facade of the tomb was plastered with the original colour.

227. SIKANDERBAGH GATE, DISTRICT LUCKNOW.— The mosque situated in the southeastern corner of Sikanderbagh Gate was repaired by providing lime-concrete flooring to the prayer hall and the courtyard. The ancient wall of the monument was also replastered.

228. LAKE OF KIRAT SAGAR, DISTRICT MAHOBA.— Fallen and worn-out stone steps of the *ghat* were reset with old and new ones in position and were pointed wherever required.

229. REHALIYA SUN TEMPLE, DISTRICT MAHOBA.— After debris clearance, a flag-stone apron was provided in accordance with the original pattern.

A pathway was constructed in the temple-complex.

230. ANCIENT EXCAVATED SITE AT GANWARIA, DISTRICT SIDDHARTHNAGAR.— The exposed structures of Ganwaria were strengthened by underpinning, pointing besides watertightening the top few courses.

MADRAS CIRCLE

Kerala

231. FORT ST. ANJELO, KANNUR, DISTRICT KANNUR.— The fallen wall of the moat was reconstructed as per the original using available and new stones.

232. NETRIMANGALAM SIVA TEMPLE, PATTAMBI, DISTRICT PALAKKAD.— The fallen *lateriteprakara* wall was reconstructed as per the original.

233. FORT, ANJENGO, DISTRICT THIRUVANANTHAPURAM.^ M. S. grill fencing over a laterite toe-wall was provided in front of the main entrance. An ancient floor level was noticed while clearing the debris.

234. PARASURAMA TEMPLE, TIRUVALLAM, DISTRICT THIRUVANANTHAPURAM.— A rubble-masonry dwarf-wall was constructed.

235. SIVA TEMPLE, EYYAL (CHEMMANTHITTA), DISTRICT THRISSUR.— New flooring was provided to the granary. The walls of the same were replastered in combination mortar. A portion of the *prakara* was reset as per the original

Pondicherry

236. SVAYAMBHUNATHASVAMI TEMPLE, NEDUNGADU, PONDICHERRY.— The accumulated debris in the open *prakara* was sectioned to provide a gradient for easy draining of storm water. Red gravel was spread for consolidating the same. A stone apron was provided all round the main structure. The Ganesa and Subrahmanya Shrines were replastered in combination mortar after raking out the old and dead mortar.

Tamil Nadu

237. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHENGALPATTU-M.G.R.— The northeastern *devakulika,* situated to the east of the temple was found to be out-of-plumb. The whole structure was dismantled after proper documentation and the same was reset as per the original over a new foundation.

238. SHORE TEMPLE, MAMALLAPURAM, DISTRICT CHENGALPATTU-M.G.R.— Further clearance of sand and boulders on the southern side of the complex was carried out. The exposed steps of the

bathing *ghat-like* structure was restored by providing the missing granite stones as per the original after strengthening the laterite core.

239. MUNKUDUMISVARA TEMPLE, P.V. KALATHUR, DISTRICT CHENGALPATTU-M.G.R.— The out-of-plumb *prakara* to the west of the main shrine was reset to plumb by using the old stones and new ones for the missing stones.

240. DUTCH FORT AND CEMETERY, SADRAS, DISTRICT CHENGALPATTU-M.G.R.— As in the previous years, the dilapidated fortification on the northwestern corner was reconstructed as per the original.

241. APATSAHAYESVARA TEMPLE, TENNERI, DISTRICT CHENGALPATTU-M.G.R.— The dilapidated and leaky brick *sikhara* over the *vimana* was rendered watertight by grouting the cracks in the masonry. The stucco figures were mended in the process. The decayed wooden members covering the *garbhagriha* were replaced by new members matching the old in form and size.

242. TIRUPULISVARA TEMPLE, VAYALUR, DISTRICT CHENGALPATTU-M.G.R.— The roof of the main shrine and its axial *mandapas* was rendered watertight.

243. MURUGANATHASVAMI TEMPLE, TIRUMURUGANPOONDI, DISTRICT CoiMBATORE. ------ The accretionary lime wash over the structures was removed. New stone-laid flooring was provided wherever the old floor was found to be missing or undulating.

244. PARTHASARATHI AND KRISHNA TEMPLE, PARTIVAPURAM, DISTRICT KANYAKUMARI.— The out-of-plumb *adhishthana* of the *mcmdapa* was dismantled and reconstructed as per the original.

245. CLIVE'S BUILDING, FORT. ST. GEORGE , MADRAS, DISTRICT MADRAS.— The leaky Madras-type terrace of the western wing was dismantled for reconditioning it by replacing the wooden decayed members.

246. RAMPART WALLS, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.— The rank vegetation grown over the rampart wall was removed.

247. FORT, VELLORE, DISTRICT NORTH ARCOT-AMBEDKAR.— The fallen and out-of-plumb wall of the moat on the northeastern corner was taken up for reconstruction. The wall was fallen out-of-plumb for 9m and further 22m was completely collapsed. The former was dismantled after proper documentation. The whole length was reconstructed to the original alignment. In the process, the out-of-plumb wall was reconstructed as per the original whereas the collapsed portion was reconstructed with fallen stones, retrieved from the debris accumulated in the moat. Sufficient strengthening by way of arranging boulders in gravel matrix was done to the face of the embankment. Proper drainage was provided to the exterior of the reconstructed portions.

248. SUGRIVESVARA TEMPLE, SIRCARPERIYAPALAYAM, DISTRICT PERIYAR.— The dismantled *mukha-mandapa* was reconstructed upto *prastara* level. The work is in progress.

249. SIVA TEMPLE, ARIYUR, DISTRICT PUDUKKOTTAI.— In continuation of the last year's work *(1994-95,* p. 129), the main shrine and its axial units were dismantled and are being reconstructed as per the original. The work is in progress.

250. SIVA TEMPLE, IRUMBANADU, DISTRICT PUDUKKOTTAI.— In continuation of the last year's work *{1994-95,* p. 125), the main structure was documented and carefully dismantled. New, strong suitable foundation was provided and the reconstruction of the structure as per the original is in progress. Old stones retrieved from the debris and new stones for the missing ones are being used in the reconstruction.

251. SIKHANATHASVAMI TEMPLE, KUDUMIYANMALAI, DISTRICT PUDUKKOTTAI.— The brick *gopura* over the *mahadvara* was devoid of the original plaster coat thereby rendering the structure unprotected from the vagaries of nature resulting in the development of cracks in the masonry, growth of vegetation and general deterioration of the masonry. The topmost *tola* was taken up for conservation. The cracks were grouted and a layer of fine plaster was applied over the masonry. The work is in progress.

252. SIVA TEMPLE, NIRPALANI, DISTRICT PUDUKKOTTAI.— The brick masonry *sikhara* of the *vimana* was bereft of its original plaster leading to development of cracks in the masonry and a leaky superstructure. The whole *sikhara* was replastered in comibation mortar topped by a layer of fine ground lime paste. Suitable traditional colouring was provided (pl.LXX).

253. KAILASANATHA TEMPLE, VELLANUR, DISTRICT PUDUKKOTTAI.— The whole monument had gone out-of-plumb due to seepage of water into its core, for which the monument was carefully dismantled after proper documentation. The reconstruction of the structure as per the original has been completed upto the eleventh course and the work is in progress (pl.LXXI).

254. FORT, ATTUR, DISTRICT SALEM.— The fallen curtain-wall is being reconstructed as per the original in brick masonry.

255. NARASIMHASVAMI TEMPLE, NAMAKKAL, DISTRICT SALEM.— The *sikhara* of the Amman shrine was rendered watertight. A stone flooring has been laid to the open *prakara.*

256. NITISVARASVAMI TEMPLE, SRIMUSHNAM, DISTRICT SOUTH ARCOT.— The roof of the open pillared *mandapa* was rendered watertight. The veneer of the *prakara* on the western and the southern sides was dismantled and reset as per the original as they were out-of-plumb.

257. BRIHADISVARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT TIRUCHCHIRAPPALLI.— The accumulated debris to the north of the *mahadvara* was cleared to expose the original working level. The exposed structures were consolidated. The massive door-jambs of the outer, incomplete *mahadvara* were mended by providing concealed I-section girders and erected to plumb.

258. ERUMBESVARA TEMPLE, TIRUVERUMBUR, DISTRICT TIRUCHCHIRAPPALLI.— The undulating *open prakara* on the eastern and southern sides were reset over a concrete layer. New stones were provided for the missing ones. Choked drain on the southern side was reconditioned. The decayed weathering course over the *maha-mandapa* and the Palliyarai of the Amman Shrine was relaid.

259. SIVA TEMPLE, VALIKANDAPURAM, DISTRICT TIRUCHCHIRAPPALLI.— The fixing of *nasika* of the *gopura* was done. The *tolas* were given a layer of fine ground plaster.

260. ROCK-CUT TEMPLE AND SCULPTURES, SIYAMANGALAM, DISTRICT TIRUVANNAMALAI-SAMBUVARAYAR.— The roof of the *mandapa* was rendered watertight.

261. PATTABHIRAMA TEMPLE, NARASINGARAYANPETTAI, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— The moss and lichen over the brick masonry *gopura* of the *mahadvara* was cleaned. The decayed plaster was removed. The top three *tolas* were rendered watertight by applying a rough coat of combination mortar topped by a layer of fine ground lime-mortar after grouting the cracks.

262. RAJAGIRI FORT, GINGEE, DISTRICT VILLUPURAM-RAMASAMY PADAYACHIYAR.— In continuation of the previous year's *(1994-95,* p. 130) work, the facade of the 'Horse Stables' was restored to its original position by reconstructing the *chhajja* and replastering the surface of the wall.

MINI CIRCLE, GOA

Goa

263. FORT AGUADA, CANDOLIM.— The roots of plants grown in crevices of cracks were removed manually and then burnt with the help of blowers. Part of the eastern side of the fortification wall was pointed.

264. MAHADEVA TEMPLE, KURDI.— The transplantation of the temple, which was dismantled in 1984, was completed. Before the actual dismantling, the temple was fully documented by following an elaborate procedure of recording, fixing and numbering each stone through drawings and photographs. The fragile laterite pieces broken during dismantling, loading, transportation and unloading, were joined together with steel dowels. The broken granite *nandi* was also joined by dowels.

265. MAHADEVA TEMPLE, TAMDISURLA.— The moss and lichen grown over the temple was scrubbed off. The main *sikhara* portion through which water was leaking into the *garbhagriha* was repaired. The roof of the *antarala* and *sabha-mandapa* were watertightened. A compound gate was provided to stop the entry of catties and unauthorized visitors.

266. SE' CATHEDRAL, VELHA GOA.— The faulty design of the Se' Cathedral and short *chhajjas* in heavy rainfall area had resulted in weak foundation through unplastered pavement. An apron all around the monument was provided in order to arrest the water from getting into the foundation. The apron was further connected with gutters so that entire rain-water disposed off to a distance without posing any damage to the monument. Old and decayed windows through which rain-water was getting into the church were also replaced. Welded mesh was also fixed.

MINI CIRCLE, SHIMLA

Himachal Pradesh

267. LAXMI-NARAYAN TEMPLE, BHARMAUR, DISTRICT CHAMBA.—Bulged and damaged stone masonry was restored by underpinning and watertightening etc.

268. MANI MAHESH TEMPLE, BHARMAUR, DISTRICT CHAMBA.— Decayed floor was repaired by replacing missing stones, concreting and pointing as per the original pattern.

269. SIVA TEMPLE, BAIJNATH, DISTRICT KANGRA.—New metal *kalasa* was provided in place of the original. The ancient tank was provided with M.S. grills.

270. KANGRA FORT, KANGRA, DISTRICT KANGRA.— Decayed stone flooring was replaced and the damaged main gate was repaired by fixing of dressed flag-stones.

271. ROCK-CUT TEMPLE, MASRUR, DISTRICT KANGRA.— Restoration of damaged retaining wall and foundation were strengthened and watertightened.

272. NURPUR FORT, NURPUR, DISTRICT KANGRA.— The dilapidated main gate and damaged fortification wall were repaired and restored by underpinning, stitching of cracks and grouting etc.

273. GAURI SHANKAR TEMPLE, DASSAL, DISTRICT KULLU.— Damaged platform and *sikhara* of the temple was repaired.

274. GAURI SHANKAR TEMPLE, NAGAR, DISTRICT KULLU.— The bulged-out portion of the *sikhara* of the temple was repaired after dismantling and resetting the stones.

275. MARKULA DEVI TEMPLE, UDAIPUR (LAHAUL), DISTRICT LAHAUL AND SPITI.— The platform of the temple was repaired.

276. TABO MONASTERY, SPITI, DISTRICT LAHAUL AND SPITI.—Damaged *choktens* were restored and a wooden railing provided in Dukhang. A stone paved pathway were constructed at the monastery.

277. PANCHAVAKTRA TEMPLE, MANDI, DISTRICT MANDI.—Damaged platform and *sikhara* were restored.

278. TRILOKINATH TEMPLE, MANDI, DISTRICT MANDI.— Damaged and decayed stones of the *sikhara* were replaced as per the original pattern.

SRINAGAR CIRCLE

Jammu and Kashmir

279. MUGHAL ARCADE AND SPRING, VERINAG, DISTRICT ANANTNAG.— Steps were initiated to provide M. S. railing mounted over the edge of the promenade around the spring.

280. SHANKARAGAURISVARA TEMPLE, PATTAN, DISTRICT BARAMULLA.—The work of fencing the area was continued.

281. FORT, AKHNOOR, DISTRICT JAMMU.— The stitching of vertical cracks on the northern wall of the Sheesh Mahal is in progress. The fallen buttress-wali supporting the southern fortification was reconstructed.

282. SIVA TEMPLE, BILLAWAR, DISTRICT KATHUA.— In continuation of the previous year's *{1994-95,* p. 131) work, the repair to the *mandapa* platform on western side was taken up by resetting the veneer-stones after filling the core. The steps of the porch on western side were also restored.

283. TRILOCHAN NATH TEMPLE, MAHADERA, DISTRICT KATHUA.— Steps were initiated to provide barbed-wire fencing around the newly acquired land.

284. BUDDHIST MONASTERIES, ALCHI, DISTRICT LEH (LADAKH).— Random rubble pathway over base concrete towards Lotsva Lhakhang was provided. The porch of Sumtsek, Lotsva Lhakhang and Manjusri Lhakhang were provided with stone pitching. The steps in front of the Dukhang were repaired.

285. BUDDHIST MONASTERIES, HEMIS, DISTRICT LEH (LADAKH).— The rooftop of the main shrine was watertightened after raking out the dead earth packing. The top of the parapet was also repaired and watertightened.

286. BUDDHIST MONASTERIES, LAMAYURU, DISTRICT LEH (LADAKH).— The south and west sides of the monastery-complex was provided with stone pathway. In order to strengthen the superstructure, retaining wall on the west side was constructed.

287. BUDDHIST MONASTERIES, PHYANG, DISTRICT LEH (LADAKH).— The construction of retaining wall on north side of the monastery was completed and the pathway restored in stone masonry.

288. SHEY PALACE, SHEY, DISTRICT LEH (LADAKH).— The remaining portion of the pathway around the shrine was relaid. The roof of the first and second floor of the main shrine was mud concreted and top watertightened and the damaged parapet-walls restored.

289. ANCIENT STUPA, TISSERU, DISTRICT LEH (LADAKH).— The work of restoration of weathered and out-of-plumb mud brick wall at fourth level on north side was taken up and completed. The roof of the passage was provided with wooden poles as per the original. The steps on the western side were restored.

290. BUDDHIST MONASTERIES, THICKSEY, DISTRICT LEH (LADAKH).— In continuation of the previous year's (*1994-95,* p. 131) work, the remaining portions of the Dukhang Karmo was provided with wooden flooring over mud concrete base. The rooftop was watertightened.

291. AVANTISVAMIN TEMPLE, AVANTIPURA, DISTRICT PULWAMA.— The construction of dwarf wall and barbed-wire fencing were taken up including painting of the grill gate.

292. AVANTISVARA TEMPLE, AVANTIPURA, DISTRICT PULWAMA.— Repairs to the office and store rooms were taken up by fixing doors and windows.

293. SIVA TEMPLE, PANDRETHAN, DISTRICT SRINAGAR.— Desilting of drains and ponds of the temple was taken up. A sculptureshed was constructed.

294. PATHER MASJID, SRINAGAR, DISTRICT SRINAGAR.— Dead and weathered lime-concrete of the roof was removed and relaid afresh with stone grit and surface replastered.

295. TOMB OF ZAIN-UL-ABDIN'S MOTHER, ZAINA KADAL, DISTRICT SRINAGAR.— The rank vegetation grown over the domes was eradicated and weathered and broken portions restored.

296. KALA DERA TEMPLE I, MANWAL, DISTRICT UDHAMPUR.— The bulged-out portions of the steps and *mandapa* on the eastern side was restored by resetting the stones as per the original.

297. FORT, RAMNAGAR, DISTRICT UDHAMPUR.— The out-of-plumb and cracked portions of the eastern bastion was dismantled and restored as per the original and the joints were pointed after raking out pulverized mortar.

298. NAWA MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.— The accumulated debris in front of the Mahal was partially removed.

VADODARA

CIRCLE*Daman*

and Diu

299. HOLY JESUS CHURCH, DAMAN, DISTRICT DAMAN AND DIU.— Dead lime-concrete of the verandah were removed and relaid afresh as per the original. Distempering to inner walls and white/colour wash was applied on outer side.

300. TOWER OF SILENCE, DIU, DISTRICT DIU.— The worn-out/damaged ashlar stone masonry was dismantled and provided with new ones after dressing, moulding, etc., completed as per the original and missing lime-plaster was also provided.

Gujarat

301. MONUMENTS AT SARKHEJ, DISTRICT AHMEDABAD.— In place of the missing ones, stone grills were provided to the tank, palace and *harem* as per the original. The worn-out stone pillar was replaced. Stone steps were provided after dressing. The deep lime-concrete floor was removed and provided with new ones as per the original.

302. JAMI MASJID, AHMEDABAD, DISTRICT AHMEDABAD.— Decorative lamppost of stone existing in the courtyard were replaced as per original and its worn-out stone steps were also replaced.

303. QUTB SHAH MOSQUE, AHMEDABAD, DISTRICT AHMEDABAD.— The bulged/tilted ashlar masonry were dismantled and reconstructed. The missing and worn-out stones were replaced with the new ones after dressing, moulding, etc., as per the original. The work is in progress.

304. TEEN DARWAZA, AHMEDABAD, DISTRICT AHMEDABAD.— The bulged ashlar stone masonry were dismantled carefully and reconstructed. The decayed ashlar stones were replaced with the new ones after dressing, moulding and carving, etc. The dead lime-concrete of terrace were removed and provided with fresh ones to prevent water seepage. Dead plaster from walls were also removed and provided with new ones including moulding, etc. as per the original.

305. GALTESVARA MAHADEVA TEMPLE, SARNAL, DISTRICT KHEDA.— The heavy and decorated lintels supporting dome of the *sabha-mandapa* having cracks were dismantled and replaced with the new ones after dressing, carving, etc. as per the original. Broken capitals were also replaced. The deteriorated flooring of *sabha-mandapa* was replaced.

306. SHAIKH FARID TOMB, PATAN, DISTRICT MAHESANA.— The missing ashlar stone grills *(Jali* work) were provided after carving, dressing, moulding, etc. and fallen ashlar stone masonry was restored as per the original at some places.

307. SAHASTRALINGA TANK, PATAN, DISTRICT MAHESANA.— The missing ashlar stone masonry was provided and damaged burnt-brick masonry was reconstructed with old brick to the inlet channel. The earthen embankment which was damaged due to the heavy rain was restored as per the original.

308. SUN TEMPLE AND SURYA KUND, MODHERA, DISTRICT MAHESANA.— The sunken, decayed stone steps of Surya Kund, along with its niches, were dismantled and reset after replacing all decayed stones.

309. JAMI MASJID, PAVAGADH, DISTRICT PANCHMAHALS.— The out-of-plumb ashlar masonry was dismantled and reconstructed. The missing ashlar stones and decorative lintel of windows were provided as per the original. The missing stone grill has been provided, after carving, dressing, moulding, etc. as per the original.

310. MONUMENTS AT PAVAGADH, DISTRICT PANCHMAHALS.— The out-of-plumb ashlar stone masonry of Citadel Wall (southern side), was dismantled and reconstructed with the help of chain pulley by R.R. masonry and top of the wall was watertightened.

The out-of-plumb ashlar stone masonry of the east and south Bhadra Gates (Halol Gate, Burj No. 5) have been dismantled and reconstructed with R.R. hearting masonry, as per the original. The top of the wall was watertightened.

311. OLD ENGLISH TOMB, SURAT, DISTRICT SURAT.— Dead lime-concrete of flooring, dead lime-plaster of walls and domes, etc. were removed and provided with fresh lime-concrete as per the original including floral design (pl.LXXII). The work is in progress.

312. NANDODI GATE, DABHOI, DISTRICT VADODARA.—The dead lime-concrete of terrace was removed and relaid as per the original. Damaged *kangura* moulding of brick masonry were constructed as per the original.

MONUMENTS MAINTAINED BY THE STATE

KARNATAKA

The Department of Archaeology and Museums carried out conservation work at the following monuments.—

1. VENKATAPPA ART GALLERY, BANGALORE (GOVERNMENT MUSEUM), DISTRICT BANGALORE
2. MAHA GOPURAM OF SANGAMESVARA TEMPLE AT CHADACHANA, DISTRICT BIJAPUR
3. DURGA TEMPLE AT HIRE MOSALI, DISTRICT BIJAPUR
4. VIMANA OF BAGAYAVANTI TEMPLE AT KANAKANAL, DISTRICT BIJAPUR
5. THER BAZAR MANTAPA, HAMPI, DISTRICT BELLARY
6. SUPARSVANATHASVAMY BASADI, HEGGERE, DISTRICT CHITRADURGA
7. PANCHALINGESVARA AND MALLIKARJUNASVAMY TEMPLES, SEDOM, DISTRICT GULBARGA
8. RAMES VARA TEMPLE, RAMANATHAPURA, DISTRICT HASSAN

9. MOSQUE, MARGANA KUNTE, DISTRICT KOLAR
10. VEERABHADRASVAMY TEMPLE, GULLUR, DISTRICT KOLAR
11. GULUR CHAVADI, GULLUR MATT, DISTRICT KOLAR
12. GOVERNMENT MUSEUM, MERCARA, DISTRICT KODAGU
13. ANANTHAPADMANABHASVAMY TEMPLE, HOSA-BUDANUR, DISTRICT MANDYA
14. BARBED-WIRE FENCING, GANJIPA ART GALLERY, SRIRANGAPATNA, DISTRICT MANDYA
15. MAHALINGESVARA TEMPLE, SANTE-BACHAHALLI, DISTRICT MANDYA
16. SRIRANGAPATNA FORT, SRIRANGAPATNA, DISTRICT MANDYA
17. SURAL PALACE, SURAL, DISTRICT MANGALORE
18. MURAL PAINTING OF KRISHNASVAMY TEMPLE, PALACE-COMPLEX, MYSORE, DISTRICT MYSORE
19. MAHAGANAPATI TEMPLE, JAYARAMA AND BALARAMA GATE, PALACE, FORT, MYSORE, DISTRICT MYSORE
20. DISMANTLING OF THE MADRAS TERRACE ROOF OF THE KAI SALE OF MANTAPA, WESTERN, SOUTHERN AND NORTHERN SIDES OF CHAMUNDESVARI TEMPLE, CHAMMUNDI HILL, DISTRICT MYSORE
21. SHIVAPPANAYAKA PALACE, SHIMOGA, DISTRICT SHIMOGA
22. VENKATARAMANA AND PADMAVATI TEMPLES, AKKIRAMAPURAM, DISTRICT TUMKUR
23. KUMARARAMA TEMPLE, DODAPALANAHALLI, DISTRICT TUMKUR

X. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS'

ANDHRA PRADESH

1. BHEEMESVARA SVAMY TEMPLE, GUDIMALLAM, DISTRICT CHITTOOR.— The temple was treated for the removal of limewash, red ochre patches, moss and lichen using the usual chemical methods. The dried areas were preserved by using 3% acrypol in toluene

2. GOLKONDA FORT, HYDERABAD, DISTRICT HYDERABAD.— Iron doors of Bala Hissar were subjected to chemical treatment for the removal of rust using rust inhibitor. The cleaned surface was preserved with 3% solution of acrypol in toluene.

The wooden beams and rafters of Darbar Hall were fumigated for eradication of termites and insects. The holes were sealed and consolidated using saw dust, teak pieces and fevicol. The surfaces were smooth finished and preserved using 5% solution of acrypol in toluene.

3. SVARGA BRAHMA TEMPLE, ALAMPUR, DISTRICT MAHABOOPNAGAR.— The chemical treatment of the temple was continued for the removal of moss and lichen, patches, lime deposits, soot, oily accretions and bird excreta. The cleaned and dried surface was then given fungicidal treatment and finally preserved with 3% solution of acrypol in toluene.

BIHAR

4. EXCAVATED SITE, NALANDA, DISTRICT NALANDA.—The chemical cleaning of the surface area of Monastery 1 (B) was carried out by soft nylon brushes for removing thick layers of micro-vegetational growth, dust and dirt with the help of aqueous ammonia and teepol. The work is in progress.

5. HASAN SHAH SURI TOMB, SASARAM, DISTRICT ROHTAS.— In continuation of the last year's {*1994-95,* p. 137) work, the chemical treatment was carried out for the removal of thick layer of dried moss, lichens, algae growth, etc., by using aqueous solution of ammonia and teepol mixture. The selective use of dilute solution of oxalic acid was also made. After treatment with 5% aqueous solution of sodium pentachlorophenate, the cleaned areas were consolidated and preserved with 3% solution of polymethyl methacrylate in toluene.

' Information from : Director (Science) of the Chemical Branch of the Survey.

DELHI

6. GATEWAY TO MEENA BAZAR AND OTHER STRUCTURES SURROUNDING WOODEN FLAG POLE OF LAHORI GATE, RED FORT, DELHI.— Mainly made of red sandstone with dome of minarets and small *burjis* having marble surface contained lot of dust, dirt and mud accumulated over the stone surface resulting in the formation of a hard grit layer. In addition to the patchy black appearance due to dried micro-vegetational growth, the stone surface was also affected by bird's excreta especially at niches, *jharokha* and three strips below *kangura* and deposition of tarry matters. The whole surface area was treated with aqueous solution of ammonia and teepol for cleaning dust, dirt and microphytes etc. Bird's excreta and calcareous deposits were removed by using dilute acetic acid and the marble surface of the *burjis* was cleaned by employing clay pack method. Then the entire area was given fungicidal treatment with sodium pentachlorophenate and finally preserved with aqueous solution of potassium siliconate (Repellin super) in 1:20 dilution. Thick deposits of dust, dirt and red stain due to betel's spitting of visitors in the chanells of the Nihar-i-Bihist were cleaned with aqueous ammonia and teepol solution. The removal of the red and yellow stains was done by clay pack-method.

7. LAL BANGLA, DELHI GOLF CLUB, NEW DELHI.— The deposits of dust, dirt and micro-vegetational growth were removed by gentle brushing with dilute solution of ammonia and teepol B 300 mixture. Adherent calcareous deposits were cleaned by dilute acetic acid and the cleaned surfaces were given fungicidal treatment with 1 % solution of sodium pentachlorophenate and finally preserved with 3% solution of polymethyl methacrylate in toluene.

8. MAIN DOME OF HUMAYUN'S TOMB, NIZAMUDDIN, NEW DELHI.— The onion-shaped dome made of marble with cylindrical wall of sandstone was fully covered with dust, dirt, soot and microphytes. As a result, the marble surface had acquired yellowish appearance. The brass pinnacle at the top of the marble dome was observed to have attained a reddish brown tinge. The brass pinnacle was treated with dilute solution of sodium potassium tartrate and sulphuric acid for the removal of reddish brown tinge. The cleaned area of brass was preserved with 2% solution of polyvinyl acetate. The marble surface was treated with solution of ammonia and teepol for the removal of dust, dirt and microphytes. The greasy stains were removed by clay pack method. The work is in progress (pl.LXXIIIA).

9. RED FORT, DELHI.— In continuation of the last year's work *(1994-95,* p. 138), the chemical treatment of Diwan-i-Khas was resumed for the removal of accretionary deposits of dirt, dust and greasy matter on the west side and *burjis.* The marble surface between the floral designs was cleaned meticulously with the help of dilute solution of ammonia and teepol using cotton swabs. The cleaning of marble with inlay work and plain marble surface was carried out with bentonite clay pack.

The marble surface on the western side of Shah Burj exposed to all kinds of pollutants like dust, dirt, soot and greasy deposits caused by frequent touches by the visitors and scrubbings with ink, paint, charcoal etc. were removed by ammonia-teepol solution. The marble surface was cleaned with clay pack method using bentonite clay with suitable additives to maintain its pH around 9. The greasy and oily matters were removed by organic solvents *viz.,* methanol and a drop of morpholine using cotton swabs. Scrubbings were removed by petroleum ether or benzene.

Three sides of the rampart under flagmast and two *burjis* were subjected to chemical treatment. Muddy accretions and micro-vegetational growth with dilute aqueous ammonia and teepol solution were removed. The calcareous deposits were removed by dilute glacial acetic acid and finally preserved with 3% solution of polymethyl methacrylate.

10. TOMB OF IMAM ZAMIN, QUTB COMPLEX, NEW DELHI.— The north side of Ilahi-Darwaza exposed to the atmospheric conditions had accumulated a lot of dust, dirt, smoke, soot and vegetational growth over the outer surface giving it black appearance.

The lower areas had become greasy due to the deposition of grease by repeated touching by the visitors. The surface was chemically treated using ammonia-teepol mixture solution for these accretionary deposits. Attempts were made to ensure that the lime-plaster surface did not have any loss by consolidating the fragile areas before the chemical treatment. The marble surface was not cleaned by clay pack method and ink stains were removed by the application of Chloramine-T. The salt affected areas were subjected to paper pulp treatment. The entire cleaned area except the marble surface was given fungicidal treatment and finally preserved with Repellin Super in water in 1:2 dilution.

GOA

11. SE-CATHEDRAL CHURCH, VELHA GOA, DISTRICT PANAJI.— The mural paintings were subjected to chemical treatment using suitable organic solvents in different proportions. These chemically cleaned mural paintings were then preserved with 1% polyvinyl acetate solution in toluene.

12. ST. FRANSIS ASSISI CHURCH, VELHA GOA, DISTRICT PANAJI.— During the year under review, the main chemical treatment involved the mending of frames, filling of cracks, fissures with saw dust, fevicol, insecticide and finally colour matching.

13. SACRISTY OF ST. CATHEDRAL CHURCH, VELHA GOA, DISTRICT PANAJI.— To take up the chemical treatment work of panel, canvas paintings, polychrome sculptur -s and gilded altars, initially the superficial dust, dirt etc. were brushed off. The back side of the panel paintings in some cases was replaced with plywood and insecticide was also sprayed. Relining of canvas paintings in many cases was carried out as the original canvas had become weak. The retouching of canvas paintings was also carried out.

GUJARAT

14. AHMED SHAH'S TOMB, AHMEDABAD, DISTRICT AHMEDABAD.— In order to remove micro-vegetational growth, dust, dirt, accretionary lime deposits, bird's droppings etc., the chemical treatment work was carried out on the exterior side of this tomb. The micro-vegetation, dust, dirt and bird droppings were removed in the first step by chemical treatment using aqueous solution of non-ionic detergent teepol and ammonia mixture. In the second step very dilute solution of acetic acid was used for removing accretionary calcareous deposits. The fungicidal treatment was given by spraying 2% suspension of zinc-silico fluoride and finally preserved by applying 3% solution of perspex in toluene.

15. STEP-WELL, ADALAJ, DISTRICT GANDHI NAGAR.— The stone sculptures and carvings of the uppermost storey of the step-well were subjected to chemical treatment for removing the accretionary deposits of dust, dirt, lichens, moss and bird's droppings. The cleaned stone surface was preserved by applying two coats of 1-2% solution of perspex in toluene.

16. MAHATMA GANDHI'S BIRTH PLACE, PORBANDAR, DISTRICT JUNAGADH.— The mural paintings covered under limewash were exposed carefully by removing the adhering lime coats over the paintings by chemico-mechanical means. The nature of work involved great skill and perseverance. The paintings were finally preserved with 3% solution of polyvinyl acetate in toluene. The portraits of Mahatma Gandhi and his parents etc. were also subjected to chemical treatment and preserved.

17. RANI-KI-VAV, PATAN, DISTRICT MAHESANA.— The dust, dirt and micro-biological deposits of stone sculptures and carvings were removed by using aqueous solution of teepol and ammonia mixture, the lime accretionary patches were removed by chemico-mechanical means using dilute acetic acid. Finally cleaned surface was preserved with two coatings of 1 % solution of polyvinyl acetate in toluene.

18. KANKESVARA MAHADEO TEMPLE, KAKANPUR, DISTRICT PANCHMAHALS.— The stone sculptures and carvings of this monument were subjected to chemical treatment for the removal of dust, dirt and micro-biological deposits using aqueous solution of teepol and ammonia mixture. The lime accretionary patches were removed by chemico-mechanical means using dilute acetic acid. Finally the cleaned surface was preserved with two coatings of 1 % solution of polyvinyl acetate in toluene.

19. KABUTAR KHANA PAVILION, PAVAGADH, DISTRICT PANCHMAHALS.— The Kabutar Khana with partly brick and partly stone structures, was covered not only with thick biological growth but also with the growth of shrubs. The entire structure was chemically treated and preserved with 3% solution of perspex in toluene.

20. GROUP OF TEMPLES, KHED AND RODA, HIMMAT NAGAR, DISTRICT SABARKANTHA.— The chemical treatment and preservation work of stone sculptures and carvings on the outer wall of these temples was taken up for the removal of micro-biological growth, lime, dirt and bird's droppings.

21. VADODARA BHAGOL, DABHOI, DISTRICT VADODARA.— Thick growth of moss, lichen, dirt, dust and bird's excreta was removed. The cleaned surface was given fungicidal treatment and finally preserved by means of perspex in toluene.

22. TAMBEKERWADA, VADODARA, DISTRICT VADODARA.— The chemical cleaning for the removal of dust, dirt and greasy matter from the wall paintings was carried out using various organic solvents. The loose flakings were consolidated.

HIMACHAL PRADESH

23. LAXMI NARAIN GROUP OF TEMPLES, CHAMBA, DISTRICT CHAMBA.— Beautiful carvings, geometrical and animal designs of Lakshmi Damodar Temple, were covered with dust, dirt, lime-plaster and vegetational growth. The lower portions of the temple were covered with a black

greasy layer due to the constant rubbing of oily hands by the devotees. Most of the accretions were removed by using 1-2% aqueous ammonia-teepol solution. Limepatches were removed by 1-2% dilute acetic acid. The entire cleaned surface was given a fungicidal treatment with 2% solution of polymethyl methacrylate in toluene.

24. ROCK-CUT TEMPLE, MASRUR, DISTRICT KANGRA.— The complex of shrines was badly affected with the growth of moss, lichen, soot, smoke, grease and oily accretions. The vegetational growths were removed by using 1-2% solution of ammonia and teepol. The deep carvings were cleaned by using soft brooms and fibres with utmost care. On the cleaned surface, a fungicidal and algicidal treatment was given with 2% sodium pentachlorophenate. The dried surface was then preserved by application of two coats of 2% solution of poly methl methacrylate in sulphur free toluene.

JAMMU AND KASHMIR

25. GROUP OF TEMPLES, KIRAMCHI, DISTRICT UDHAMPUR.— The Temple No. 2 on the north side was taken up for the chemical treatment and preservation during the period under review. The vegetational growth, algae, moss and accumulated dust and dirt were removed by using 1-2% ammonia-teepol solution with gentle brushing. The cleaned and dried area was given a fungicidal treatment using 2% suspension of zinc-silico fluoride. The dried surface was finally preserved with 2% solution of polymethyl methacrylate in toluene.

KARNATAKA

26. DURGA TEMPLE, AIHOLE, DISTRICT BIJAPUR.— The work of chemical treatment was taken up on the exterior of *vimana* walls of *navaranga* and porch for the eradication of micro-vegetational growth, removal of limewash and other ingrained accretions. The treated areas were given a coat of fungicide using sodium pentachlorophenate in water and finally preserved using Acrypol P 876 in toluene. The work is in progress.

27. CAVES, BADAMI, DISTRICT BIJAPUR.— The sculptures in Caves I to III were chemically cleaned for the removal of vegetational growth, soot etc., using a mixture of aqueous ammonia and teepol (1-2%) whereas glacial acetic acid in water was used for the removal of limewash. For cleaning of paintings, ethylene glycol, monoethyl ether with turpentine as restrainer was used. The plaster of Paris was used for filleting the lacunae and poster colours were used to reintegrate the filletted and filled areas. Preservative coat of 1% polyvinyl acetate in toluene was finally applied on the treated areas. The work is in progress.

28. VIRUPAKSHA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.— The chemical treatment work of this temple was continued for the removal of micro-vegetational growth, soot and oily accretions from the *vimana* (exterior), subshrines, exterior walls, eastern and western entrances using ammonia-teepol solution. The cleaned and dried surface was given a fungicidal treatment and preserved with 1% solution of Acrypol P 876 in toluene. The work is in progress.

29. CHENNAKESAVA TEMPLE, BELUR, DISTRICT HASSAN.—Vegetational, oil and sooty accretions were removed from the sculptures on the exterior walls and niches, the brackets and a few location

in the interior using ammonia-teepol solution. The lime splashes were removed by using dilute glacial acetic acid, 0-5% sodium pentachlorophenate in water was used as fungicide and Acrypol P 876 in toluene as preservative. The work is in progress.

30. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.— In continuation of the last year's . *(1994-95,* pp. 142-3) work, the walls and ceilings of *navaranga* hall, the interior of *nandi mantapa* opposite Shantalesvara Shrine were subjected to chemical treatment. The oily and sooty accretions were removed using mixture of ammonia and teepol solution whereas calcareous and other ingrained accretions were removed by chemico-mechanical means using aqueous acetic acid solution. The treated areas were preserved using 1% Acrypol P 876 in toluene.

3 1. GOMATESVARA STATUE AND ADJOINING MANTAPA, SRAVANABELAGOLA, DISTRICT HASSAN.— The chemical treatment work was continued for the removal of various types of unguents from the untreated parts of the Gomatesvara statue, the wall and pillars adjoining *mantapas* of the eastern side of the statue. The work involved the removal of vegetational growth, ochre patches and lime wash accretions. The chemicals used were ammonia-teepol solution and glacial acetic acid in water. The treated areas were preserved with Acrypol P 876 in toluene.

32. PANCHALINGESVARA TEMPLE, GOVINDANAHALU, DISTRICT MANDYA.— The interior of ceiling, *sukanasi,* sanctum of Isanesvara Shrine were taken up for chemical treatment. The calcareous accretions were removed by using aqueous acetic acid solution. The cleaned and dried surface was preserved using 1% Acrypol P 876 in toluene.

33. TIPU SULTAN'S MAUSOLEUM AND GUMBAZ, SRIRANGAPATNA, DISTRICT MANDYA.— In continuation of the last year's *(1994-95,* p. 143) work, the chemical treatment was carried out for the removal of old yellow translucent varnish coat using 2-ethoxy ethanol with turpentine as restrained The lacunae in the rendering were filled in with plaster of Paris followed by colour reintegration using poster colours. The work is in progress.

KERALA

34. SIVA TEMPLE, THIRUVANJIKULAM, DISTRICT THRISSUR.— Stone pillars and wood carvings were taken up for removal of dust, dirt and oily accretions using ammonia-teepol solution. Different coatings of paint and varnish layer were removed from the wood carvings using methanol and diacetone alcohol. After insecticidal treatment with Flytox, the cleaned and dried areas were preserved using 2% polyvinyl acetate in sulphur free toluene. For the treatment of paintings, firstly the old preservative coating was removed by treatment with toluene. The paintings were then treated with a mixture of diacetone alcohol, triethanol amine, butyl lactate etc., for the removal of other accretionary deposits and remnants of old preservative coating. These paintings were finally given a preservative coating of 1.5% polyvinyl acetate in sulphur free toluene.

35. VADAKKUNNATHA TEMPLE, THRISSUR, DISTRICT THRISSUR.— Dust, dirt, muddy and oily accretions were removed from the wooden carvings in *namaskara-mandapa* of Siva shrine. Then the surfaces were treated with methanol for drying, followed by insecticidal treatment with Flytox,

Pyrethrum extract. The sculptured basement walls around the *mandapa* were also subjected to chemical treatment for the removal of similar accretions. Finally the carvings and sculptures were given a preservative coating of 3% solution of acrypol in toluene.

MADHYA PRADESH

36. MAHADEVA TEMPLE, PALI, DISTRICT BILASPUR.— The exterior wall of the temple was treated for the removal of accretions, limewash, moss and lichen by the usual chemical methods. The cleaned dried surface was given fungicidal treatment and finally preserved.

37. GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATARPUR.— In continuation of the last year's *(1994-95,* p. 144) work, the chemical treatment was carried out on the external south facing wall of the *maha-mandapa* and the entrance porch of Kandariya Mahadeva Temple. The cleaned areas were given fungicidal treatment and preservative coat.

In continuation of the previous year's work *(1994-95,* p.144), the surface consolidation and strengthening of the frieze around the platform terrace of the western group of temples was repeated in order to restore and reinforce the mechanical strength of the stone so as to make them less susceptible to further deterioration. The work is in progress.

The exterior south-east portion of the *sikhara* of the Laxmana Temple was treated for the removal of black stains and accumulated accretions by wet chemical cleaning methods. The dried and cleaned surface was given a fungicidal treatment with 1 % zinc silico fluoride and finally preserved with 2 coats of polymethyl methacrylate in toluene.

38. RAJA BIR SINGH DEO PALACE, DATIA, DISTRICT DATIA.— During the period tracing of the paintings on the facade of the main entrance gate was done and subjected to chemical cleaning, consolidation, strengthening of the loose and damaged painted plaster and colour reintegration. The work is in progress.

39. ROCK-CUT CAVES, BAGH, DISTRICT DHAR.— The chemical conservation work was mainly carried out in Cave 2 for the preservation of mural paintings and conservation of relief sculptures, by removing the dust, dirt and cobwebs, consolidating the pigments, fixing, filleting and edging the loose and damaged plasters. Most of the fragmentary remains of the paintings in other caves were also chemically treated and conserved.

The *dvarapala* figure on the south wall had sustained damages on the upper part including the crown. On the western wall, the head of the Buddha image which was in danger of being crumbled down was fastened skillfully by means of steel wires anchored at the back relief wall. The wide crack and gap in the sculptures were thoroughly grouted and filled with mortar, epoxy resins. The sticky dirt and sooty layers were removed by using a solution of alcoholic ammonia in distilled water.

Apart from the above works, fumigation of cells was carried out by Celphos, Bromofume etc. and the temperature and relative humidity conditions in the caves were monitored.

40. FORT, GWALIOR, DISTRICT GWALIOR.— The chemical treatment and preservation work of the relief figures of the Jaina Tirthankaras and carvings in Cave 26 was continued. The entire sandstone surface in the interior of the cave was subjected to chemical treatment for the removal of dust, dirt, bat excreta and thick accretionary coat of limewash. The cleaned surface was given a fungicidal treatment and preserved using 2% polymethyl methacrylate solution in toluene.

41. GHAUS MOHAMMAD TOMB, GWALIOR, DISTRICT GWALIOR.— The paintings in the ceiling of the main verandah of the mausoleum were subjected to chemical treatment for the removal of all kind of accretions, fixing and consolidation of loose pigment layer and plaster, colour reintegration of the paintings and finally application of a suitable preservative coat.

The sandstone screen having brown-black accretionary deposits of dust, dirt, bird droppings and stains of micro-vegetational growth were chemically cleaned using 2% ammonia-teepol solution. The work is in progress.

42. ROCK-SHELTERS, BHIMBETKA, DISTRICT RAISEN.— The paintings on the Rock-Shelters 2,4 and 5 were chemically cleaned for removing dust, dirt, bird droppings and cobwebs using selective organic solvents mainly in different concentrations. The solvents used were toluene, acetone, methanol, dimethyl formamide, diacetone alcohol and diethyl ether. The previous preservative coatings were removed by the application of a suitable combination of toluene and acetone with the help of cotton absorbant. The cleaned surface was then given a preservative coat with 2.5-3.0% polymethyl methacrylate solution. The work is in progress.

43. THE GREAT STUPA AT SANCHI, DISTRICT RAISEN.— The stucco-plastered surface of the dome of the stupa was subjected to chemical cleaning using 3-5% solution of ammonia and non-ionic detergent. The cleaned area was given fungicidal treatment with 1% solution of sodium pentachlorophenate. Consolidation was done with 0-5-10% polymethyl methacrylate and finally preserved by applying two coats of 1 -2% polymethyl methacrylate in toluene.

MAHARASHTRA

44. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD.— The loose painted plaster in the ground floor of Cave 6 was consolidated by injecting polyvinyl acetate emulsion which also involved fixing of bulgings, filling of holes, cracks, edging, etc. The filled in areas were suitably tinted using earth colours. The marks of bat's excreta in the cells and verandah of first floor, were significantly removed by paper pulp application using ammonium bicarbonate solution followed by distilled water for this treatment. The walls and sculptures after cleaning were finally preserved with 2% polyvinyl acetate solution.

The painted surface on the ceiling of south aisle and also on pillars, pilasters and door-jamb in the ante-chamber of Cave 17, covered with tenacious accretions of resinous materials *viz.,* shellac, ingrained dust etc. was subjected to chemical treatment. Mixtures of different organic solvents such as morpholine, butyl lactate, n-butyl amine, dimethyl formamide, diacetone alcohol, cellosolve, turpentine, etc., were used in different combinations. The chemically treated areas were allowed to

dry completely and then given a very thin coat of preservative solution so as to consolidate the pigment particles.

The painted plaster on the west wall was consolidated with the help of polyvinyl acetate emulsion. The bulged areas were fixed with the help of plaster of Paris and polyvinyl acetate emulsion. Likewise the filling up of holes, cracks and edging was also carried out. The filled in areas were suitably colour matched as per colour scheme of adjacent areas using earth colours.

The appearance of chalkiness on the painted surface in this cave especially on the west and north sides has been observed. The north side wall has already been chemically treated. During the period under review, the painted surface on the west side which over the year has slowly developed chalkiness obscuring the fine details of the paintings was subjected to chemical treatment with appreciable response.

To prevent the damage to the paintings due to insect activity — a perpetual problem, insecticidal treatment is being carried out periodically by spraying 2% pyrethrum extract solution in kerosene only on the unpainted surface. With a view to arrest insect activity as a whole, the Cave Nos. 16 and 17 were fumigated with ethoxide (carboxide) gas which is a mixture of ethylene oxide (10%) and carbon dioxide (90%). The caves were sealed airtight before fumigation and kept sealed for thrity-six hours. Thereafter, the caves were opened and degasing allowed for eight to ten hours before the visitors could be permitted to enter the caves.

In order to record variation of temperature and relative humidity on Caves 1, 2, 6, 16 and 17, the monitoring is being done regularly thrice a day using whirling hygrometer. Besides it, continuous recording of temperature and relative humidity is also carried out with the help of thermo hygrographs in Cave Nos. 1 and 17.

45. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.— The chemical treatment work was continued on the exterior surface of the ground on the western side and stucco plaster on the main platform, back side of buttress wall for the removal of dark black accretions of dried vegetational growth using 1% ammonia non-ionic detergent solution. The cleaned areas were given a fungicidal treatment and preserved with Acrypol P in toluene.

46. SIVA TEMPLE, KOPESVARA (KHIDRAPUR), DISTRICT KOLHAPUR.— The stone sculptures on the exterior surface of the main temple and interior as well as exterior surfaces of *svarga-mandapa* covered with thick coats of dust, dirt, moss, lichen and other accretionary deposits were chemically treated by the usual chemical methods. The small trees growing over some parts of *sikhara* and *svarga-mandapa* were injected with tree killer, prepared by mixing suitable proportions of arsenic oxide in sodium hydroxide, casein, etc. The loose sculptures were consolidated using epoxy resin formulation. After chemical treatment, 3-4% of fungicide was applied. The dried and cleaned surface was given a preservative coat of 3% Acrypol P in toluene.

47. CAVES, KARLE, DISTRICT PUNE.— The chemical treatment work was continued for the removal of thick layer of dust, dirt and soot deposited on the mural paintings over the pillars. It was

observed that the mixture of organic chemicals had to be varied at different places. The solvents mainly used were morpholine, butyl lactate, N-butyl amine, diacetone alcohol, cellosolve, methyl alcohol, dibutyl phthalate, ethyl acetate, turpentine, etc.

ORISSA

48. LINGARAJA TEMPLE-COMPLEX, BHUBANESWAR, DISTRICT BHUBANESWAR.— The outer surface of the Laxmi-Narasimha Temple covered with thick layer of moss and lichens was chemically cleaned using 2% aqueous solution of ammonia-teepol mixture. 2% solution of zinc silico fluoride was sprayed for arresting the micro-vegetational growth. Finally 2% solution of PMMA in toluene was applied as a preservative coat on the dried surface. Thick micro-vegetational growth along with the dominant patches of fungus from Nahikata, Sakiswar and group of other five small temples were chemically treated with the usual methods and preserved with 2% solution of PMMA in toluene.

49. VAITAL DEUL, BHUBANESWAR, DISTRICT BHUBANESWAR.— The outer surface of the temple was treated for the removal of micro-vegetational growth, pigeon droppings, dust and dirt etc. using 2% solution of ammonia-teepol mixture. The cleaned surface was given a fungicidal trearment with 2% zinc silico fluoride and preserved with 2 coats of PMMA in toluene.

50. SUN TEMPLE, KONARAK, DISTRICT PURL— Thick micro-vegetational growth was eradicated using 1-2% ammonia-teepol solution with gentle brushing. The western wall *ofjagamohana* on the south and north sides was taken up for chemical treatment work. The cleaned surface was sprayed with 2% solution of zinc silico fluoride and preserved with 2% solution of polymethyl methacrylate in toluene. The work is in progress.

51. LORD JAGANNATHA TEMPLE, PURI, DISTRICT PURL— The deplastered surface was chemically treated with 2% solution of acetic acid for the removal of tenacious lime-plaster accretions. Thereafter, the surface was treated with ammonia-teepol solution to remove any residual acetic acid and finally thoroughly washed with water.

PONDICHERRY

52. SVAYAMBHUNATHA SVAMY TEMPLE, NEDUNGADU, DISTRICT KARAIKAL.— The temple was chemically treated for removing micro-vegetational growth, dust, dirt and oily accretions using aqueous solution of ammonia-teepol in 1:3 ratio. Limewash accretions from the interior sculptures were removed using dilute acetic acid solution. After complete cleaning, 1 -5% solution of sodium pentachlorophenate was applied as fungicide and finally on dry surface 3% PMMA in toluene was applied as preservative. The work has been completed.

53. SHRI MOOLANATHASVAMY TEMPLE, BAHOUR, DISTRICT PONDICHERRY.— The sculptures were treated with teepol-ammonia solution for the removal of dust, dirt and oily accretions. The oily accretions were removed with very dilute solution of sodium hydroxide and finally washed with plenty of water. After complete cleaning sodium pentachlorophenate was applied. The dried surface was then given a preservative coat of acrypol in toluene. The paintings on stucco figures in the *mandapa* were also cleaned with toluene and cotton swabs.

RAJASTHAN

54. DIG PALACE, DIG, DISTRICT BHARATPUR.— The marble surface on south-west face of Suraj Bhavan was chemically cleaned to remove bird's excreta, yellowishness, iron stains, soot etc., by means of clay pack method using bentonite clay with different additives like hydrogen peroxide, liquid ammonia, teepol, triethanolamine, methanol in suitable proportions. The red sandstone *jali* work and parapet-wall were subjected to chemical treatment for the removal of superficial accretions using dilute solution of ammonia and teepol. The cleaned areas were given fungicidal treatment and preserved with 2% solution of PMMA in toluene.

55. GHATESVARA MAHADEVA TEMPLE, BODOLI, DISTRICT CHITTAURGARH.— Chemical treatment work on the exterior surface of remaining north-east and south-west sides of the temple was taken up for the removal of micro-biological accretions, dust etc., using 3-5% ammonical water. Thick coating of lime was removed by chemico-mechanical means using 2% solution of acetic acid. The cleaned surface was subjected to fungicidal treatment with sodium pentachlorophenate and finally preserved with 2% solution of PMMA in toluene. The work is in progress.

56. SHRINGAR CHAULI TEMPLE, BADOLI, DISTRICT CHITTAURGARH.— The beautiful and intricate carvings on the exterior of the temple obliterated with thick growth of moss and lichen were subjected to chemical cleaning with the help of 3 to 5% aqueous ammonia solution. Limewash was removed by chemico-mechanical means using dilute solution of acetic acid. The work is in progress.

57. CHITTAURGARH FORT, CHITTAURGARH, DISTRICT CHITTAURGARH.— The chemical treatment of the Parsvanatha, Temple (II) was resumed by usual methods for the removal of moss, lichen, limewash and dirt using ammonia-teepol solution and acetic acid solution. The cleaned and dried surface was then treated with sodium pentachlorophenate fungicide and finally preserved with a 2% solution of PMMA in toluene.

The chemical treatment work was resumed for the removal of micro-biological growth and lime accretions from the exterior stone surface of Saat Bees Deori Group of Temples. The chemically cleaned areas were given fungicidal treatment and preserved with 2% solution of PMMA in toluene.

The chemical treatment of Kumbhashyama Temple was taken up on the north-east face of the main *sikhara* for eradication of micro-biological growth using aqueous solution of ammonia and teepol mixture. The lime-coat patches were removed by chemico-mechanical means using 2% solution of acetic acid. The chemically cleaned and thoroughly washed surface was given fungicidal treatment with 2-3% solution of sodium pentachlorophenate and finally a coat of PMMA in toluene was applied on the dried stone surface.

58. JAGAT SHIROMANI TEMPLE, AMBER, DISTRICT JAIPUR.— The chemical treatment work was resumed and taken up on the north-east side of the *sikhara* of the temple for the removal of moss, lichen, dust, dirt etc., using 3% aqueous solution of ammonia and non-ionic detergent teepol. The stratified layers of hard limewash were removed by using 1-2% acetic acid solution. The work is in progress.

59. PATWON-KI-HAVELI, JAISALMER, DISTRICT JAISALMER.— The chemical conservation work was taken up on the facade and inner verandah for the removal of dust, dirt, bird's excreta and biological growth. The cleaned surface was subjected to fungicidal treatment, followed by a preservative coating of 2% PMMA in toluene. The wooden doors were treated to remove greasy matter using organic solvents. For eradication of bats from numerous cells of the *haveli,* aluminium phosphate and ethylene dibromide were used.

TAMIL NADU

60. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHENGAI-M.G.R.— The extraction of soluble salts from the weathered granite structure was resumed by paper pulp treatment. The sculptures of Jalasayana Perumal Shrine and five Rathas were also taken up for chemical treatment. After cleaning the sculptures thoroughly, 1-5% solution of sodium pentachlorophenate was applied as fungicide and 3% solution of Acrypol-P in toluene was applied as preservative.

61. MUKTESVARA TEMPLE, KANCHIPURAM, DISTRICT CHENGAI-M.G.R.— The sculptures and stucco work *of vimana* of the temple were subjected to chemical treatment with teepol and ammonia solution for the removal of dust, dirt, bird's excreta and vegetational growth. In some places, the limewash accretions found on the portions of inscription were removed with dilute acetic acid. After complete cleaning, 1 -5% solution of pentachlorophenate was applied as fungicide and preserved with 3% solution of Acrypol-P in toluene.

62. MUNKUDUMISVARA TEMPLE, P.V.KALATHUR, DISTRICT CHENGAI-M.G.R.— The sculptures of the temple were treated with usual chemical treatment methods for removing dust, dirt, vegetational growth, oily and sooty accretions. The brownish patches on the walls were removed with 5% solution of oxalic acid. After cleaning the sculptures thoroughly, 1% solution of sodium pentacholophenate was applied as fungicide and 3% solution of acrypol-P as preservative. The work has been completed.

63. JALAKANTHESVARA TEMPLE, VELLORE, DISTRICT NORTH ARCOT.— The thick deposits of soot, oily and greasy accretions have been successfully removed from the sculptures and carvings by chemical treatment using aqueous solution of teepol-ammonia mixture in the ratio of 1:3. In some places, the selective use of very dilute solution of sodium hydroxide was made in controlled way for the removal of soot and oily accretions. After cleaning, the entire surface was thoroughly washed with water. Thereafter, fungicidal treatment was carried out and finally preservative coat was applied.

64. ROCK-CUT SIVA TEMPLE, THIRUMAYAM, DISTRICT PUDUKKOTTAI.— The sculptures of the temple were treated with teepol-ammonia solution for the removal of dust, dirt and vegetational growth. Limewash accretions observed in some places were removed by using dilute acetic acid. After cleaning, the surface was given a fungicidal treatment followed by a coating of 3% Acrypol-P in toluene.

65. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.— The work of chemical treatment to the *gopurams* was resumed. The vegetational growth from the sculptures was removed by using

1:3 aqueous solution of teepol and ammonia. The cleaned surface was treated with sodium penta chlorophenate as fungicide and finally preserved with 3% solution of PMMA in toluene.

66. BRIHADISVARA TEMPLE, G.K.C. PURAM, DISTRICT TRICHY.—The chemical treatment work was carried out for the removal of dust, dirt and vegetational growth from the sculptures of *vimana* using the usual chemicals. The brownish patches at some places on the walls were chemically removed by treatment with 5% solution of oxalic acid. After cleaning, the surface was thoroughly washed with water and then a fungicidal coat of 1% solution of sodium pentachlorophenate was applied. Finally on the dry surface, a preservative coat of 3% solution of Acrypol-P in toluene was applied.

UTTAR PRADESH

67. ITMAD-UD-DAULA, AGRA, DISTRICT AGRA.— The chemical treatment work was continued for the removal of old preservative coating, which had turned yellow due to deposition of soot, smoke, oil and greasy matters, from the paintings in the eastern verandah and adjoining room using mixture of organic solvents like butyl lactate, cellosolve, methanol, benzene etc. The well cleaned surface was preserved with 1% solution of PVA in toluene.

68. TAJ MAHAL, AGRA, DISTRICT AGRA.— The chemical treatment work of Taj Museum Building was resumed for the removal of micro-vegetational growth along with dust, dirt, smoke, etc., from the red sandstone surface of walls and outside corridor extending to east and west of outer entrance of platform walls of the museum building using 2-3% ammonia teepol solution. After fungicidal treatment, the cleaned and dried surface was preserved with two coats of perspex solution in toluene.

The red sandstone *jali* and platform covered with moss, lichen, dust and dirt was chemically treated using a solution of 2-3% ammonia-teepol mixture. After fungicidal treatment with sodium pentachlorophenate, the dried stone surface was preserved with two coats of 2-3% perspex solution in toluene.

The deposition of soot, smoke, greasy matter, dust, dirt, etc., had imparted yellowish and dirty black patchy appearance to the white marble surface of the crypt and staircase. General cleaning was done with mild solvent and their mixtures with the help of suitable pads. The paste of fuller's earth was also applied to remove the incrustations and stains from marble. The surface was then cleaned with distilled water.

69. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.— The entire stone surface of the Khwabgah-complex was chemically treated for the removal of dust, dirt and vegetational growth using aqueous solution of ammonia-teepol mixture. The cleaned surface was given a fungicidal treatment with sodium pentachlorophenate and finally two coats of 2% solution of perspex in toluene was applied as preservative on cleaned and dried surface.

The red sandstone surface of the Madarsa of Turkish Sultana and ruins of complex in the south-west corner of Diwan-i-Khas was chemically treated for the removal of moss, lichen, dust, dirt etc., using 2 to 3% solution of ammonia-teepol mixture, after fungicidal treatment with 2% perspex solution in toluene. The work has been completed.

The plastered surface of roof and stone surface of the entire corridor and walls of Diwan-i-Am was covered with moss, lichen and other accretionary deposits. The removal of these accretionary deposits was carried out using 2 to 3% ammonia-teepol solution. Sodium pentachlorophenate was applied as fungicide to the cleaned surface, followed by two coats of 2% perspex in toluene as preservative.

The red sandstone surface of Anoop Talao was infested with thick deposits of moss, lichen and other dirty matters due to stagnation of water in the tank. Dirty water and mud were removed from the tank and the red sandstone surface of the Talao was cleaned using ammonia-teepol solution. Two coats of 3% solution of perspex in toluene were applied as preservative.

The main entrance gate and arch of mosque in Dargah-complex was covered with thick deposits of micro-vegetational growth apart from dust and dirt which were eradicated chemically using aqueous solution of ammonia and teepol mixture. After fungicidal treatment on the cleaned surface, two coats of preservative of 2% solution of perspex in toluene was applied. The mural paintings in the arch of the mosque were cleaned to remove honey combs, dust, dirt, smoke, soot, etc., by using a mixture of organic solvents and finally preserved with 1% PVA in toluene. The work has been completed.

The wood canopy of the Dargah of Sheikh Salim Chishti, having oyster decoration, was infested with termite and wood beetles. One of the supporting beams was found to be damaged with inside appreciably hollowed at one place. Complete dusting and cleaning of the wood and pearl oyster were attended to. The voids and gaps were filled in with suitable fillers to consolidate the beam. Fungicidal treatment was also given to check the insect activities. The consolidated areas were properly finished and colour matched.

70. MOTHER OF SULTAN KHUSRU'S TOMB, KHUSRUBAGH, ALLAHABAD, DISTRICT ALLAHABAD.— The red sandstone walls of the mother of Sultan Khusru's Tomb covered with micro-vegetational growth, dust, dirt, etc., were chemically cleaned. The cleaned surface was given a fungicidal treatment followed by two coats of preservative solution of 2-3% perspex in toluene.

71. DANDESVARA GROUP OF TEMPLES, JAGESVARA, DISTRICT ALMORA.— The sandstone surfaces of the group of temples covered with micro-vegetational growth, dust and dirt were subjected to chemical treatment using dilute solution of ammonia and teepol mixture. To the cleaned suface, fungicidal spray of 3% solution of sodium pentachlorophenate was carried out. Finally a 3% solution of perspex in toluene was applied as a preservative coat on the dried stone surface.

72. GOPINATH TEMPLE, GOPESVARA, DISTRICT CHAMOLI.— The stone surface of this temple had thick deposits of micro-vegetational growth, dust, dirt and soot etc. There were growths of trees at the joints of stone. The micro-vegetational growth was removed by chemical treatment using aqueous ammonia and teepol mixture whereas the small plants, trees were removed physically as well as mechanically from the joints very carefully. After chemical cleaning, the stone surface was given fungicidal treatment and finally preserved with 3% solution of perspex in toluene.

73. RANI MAHAL, JHANSI, DISTRICT JHANSI.— The thick lime layers over the mural paintings in the Darbar Hall were removed by chemico-mechanical techniques, by softening and picking. After exposing the paintings, the accretions were removed with suitable organic solvents and finally preserved with 2% solution of PVA in toluene. The work is in progress.

74. EXCAVATED SITE, SARNATH, DISTRICT VARANASI.— The votive stupas to the left of the main shrine at the excavated site were treated chemically to remove dust, dirt and micro-vegetational growth and consolidated with 3% solution of acrylic emulsion. These cleaned surfaces were sprayed with 5% aqueous solution of sodium pentachlorophenate as fungicide. Finally these votive stupas were preserved with the help of 3 % PMMA in toluene. The work has been completed.

WEST BENGAL

75. KRISHNA CHANDRA TEMPLE, KALNA, DISTRICT BARDHAMAN.— The chemical treatment work on this temple was continued to remove dust, dirt and vegetational growth using ammonia-teepol solution. The cleaned and dried surface was consolidated by the application of 3% solution of acrypol emulsion followed by fungicidal treatment with 3% solution of sodium pentachlorophenate. Finally the surface was preserved with 3 to 4% solution of PMMA in toluene. The work has been completed.

76. BUOY BAIDYA NATH TEMPLE, KALNA, DISTRICT BARDHAMAN.— The entire surface of the temple has been chemically treated by the usual chemical methods. The cleaned surface was given a fungicidal treatment with sodium pentachlorophenate and finally preserved with 3 to 4% solution of PMMA in toluene. The work has been completed.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS '

1. A number of excavated copper coins received from Delhi Administration were chemically cleaned and preserved. The superficial loose accretions and mud were mechanically pricked and then chemically treated with a solution of alkaline potassium tartrate and dilute sulphuric acid. After repeated risings in distilled water, these were dried and preserved with 0-5% PVA solution.

2. A good number of objects varied in nature and composition *viz.,* a miniature painting of Zeenat Mahal on ivory, a toilet-box of carved wood with silver hinges and decorated with eight miniature paintings on ivory, a photograph of Bahadur Shah Zafar, a velvet embroidered carpet and a silver *huqqa* received from the Mumtaz Mahal Museum, Red Fort, Delhi, were chemically cleaned and preserved.

3. A holy *Quran* received from the Mumtaz Mahal Museum, Red Fort, Delhi, was fumigated with p-dichloro benzene for a fortnight to eradicate insect infestation.

4. Some excavated materials related to the history of Salimgarh Fort received from the Delhi Circle, were chemically treated and preserved. Besides dresses of INA heroes and other

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' Information from : Director (Science), the Chemical Branch of the Survey.

related materials, artefacts like dagger, copper coins, hooks, a pendant, etc., were chemically treated and preserved for display at the Swatantrata Sangrama Sangrahalaya, Salimgarh Fort.

5. About two hundred antiquities/objects ranging from Arms e.g., guns made of silver, iron, brass; swords made of iron with brass handle; rifles, daggers, pistols, knives, scissors, cannon, etc., paintings including water colours, lithographs, pencil sketches; photographs; badges; ribbons; flags; shoulder straps; cheque book of Azad Hind Sangh; personal diary of S. Narain Singh, Col. Khan; letters/passes; bow and arrow were chemically treated and preserved to enable their display in the Swantantrata Sangrama Sangrahalaya (pl.LXXIV-LXXV).

6. Stone sculptures of Archaeological Museum, Sarnath, were chemically treated with the help of ammonia-teepol solution. 3% fungicide has been sprayed followed by coat of preservative of 3% PMMA in toluene.

7. Two daggers and one sword received from the Archaeological Museum, Srirangapatna, District Mandya, were chemically treated for the removal of rust and other accretionary deposits. Three canvas paintings were also chemically treated after removing the translucent varnish by using 2-ethoxy ethanol, methanol with turpentine as restainer.

8. Ten palm-leaf manuscripts received from the Madras Circle of the Survey, were taken up for chemical cleaning and preservation.

9. Two ancient copper coins from the excavation at Satdhara, District Raisen, received from the Bhopal Circle of the Survey, were chemically cleaned and preserved.

10. Repairs to the polychrome sculptures and loose wooden frame of panel paintings of Archaeological Museum, Velha Goa, were also carried out.

11. Deacidification of estampages from the Eprigraphy Branch, Mysore, of the Survey, were also taken up by applying alcoholic solution of barium hydroxide or ammonia fumes. The torn alges and holes were consolidated and preserved.

12. Eight copper coins from the excavation at Mandhata, District East Nimar, received from the Bhopal Circle of the Survey, were chemically cleaned and preserved.

13. Four sari-pillars located inside the compound of the Archaeological Museum, Sanchi, Madhya Pradesh, have been chemically treated and preserved.

RESEARCH AND ANALYSIS[1]

1. The monitoring of ambient air quality and microclimate was continued by the Air Pollution Monitoring Laboratory, Agra, with a view to have close watch on the levels of various gaseous pollutants and paniculate matter to assess their impact on Agra monuments.

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[1]Information from : Director (Science), the Chemical Branch of the Survey.

(a) Annual average concentration of Sulphur dioxide in ambient air around the Taj Mahal was measured to be 21.67 ug/m^3 while the highest monthly average concentration was found to be 56.56 ug/m^3 during the month of January 1996. These measurements were carried out with the help of High Volume Sampler.

(b) The dust fall measurements were continued in the complex of the Taj Mahal, Sikandara and Red Fort, Agra. The maximum dust fall rate 43.79 MT/KM^2/Month was observed at Sikandara during the month of May[1] 1995 whereas the maximum values at Taj Mahal and Red Fort being 29-47 MT/KM^2/ Month and 22-20 MT/KM^2/Month were observed during the month of April and May respectively.

(c) The sulphation rate measurement at the Taj Mahal and Sikandara did not show any set pattern and direct relation with the level of SO_2 concentration monitored at these places. However, the maximum values of sulphation rate at both places were monitored during the month of December.

(d) The maximum average values of SPM recorded during the period (1995-96) at the Taj Mahal and Sikandara were 495-94 ug/m^3 and 207-87 ug/m^3 during the months of May and June respectively. Except the rainy-season, the SPM levels are generally observed to be on the much higher side in comparison to the limit prescribed by CPCB.

(e) The rain-water of early shower was analyzed to measure its pH, conductivity, salinity, etc.

2. Air pollution studies at Red Fort, Delhi, continued to monitor sulphation rate, dust fall rate and suspended particulate matter near the Mumtaj Mahal Museum located in the north-east side of the Red Fort complex. The dust fall rate was also collected at Humayun's Tomb, Nizamuddin, New Delhi.

Laboratories of the Chemical Branch of the Survey, Dehradun, carried out the following conservation work and analytical studies.—

(i) Five colour sketches and *farmans* received from the Archaeological Museum, Taj Mahal, Agra, were chemically cleaned and preserved. These antiquities being made of cellulose material had suffered in different ways, some had turned yellow due to development of acidity, infested with insect activity and in some cases the corners were torn and the surface was wrinkled. The necessary conservation measures like deacidification, fumigation, mending and removing of wrinkles were undertaken to preserve these *farmans* and colour sketches.

(ii) One holy *Quran* having nine hundred eighty-two pages was received from the Archaeological Museum, Red Fort, Delhi. During the period under review, the loose dust was brushed from each page with the help of sable hair brushes and the entire volume was fumigated as well as deacidified. Since the paper has significantly deteriorated, it has been decided to laminate those pages.

(iii) Fifty-eight copper and three antiquities of iron received from the excavation at Sopara were chemically cleaned and preserved.

(iv) Thirty-five library books were fumigated to arrest any outbreak of insect activity.

(v) One sample of lime-plaster along with three different pigment layers, pertaining to Sheesh Mahal, Mubarak Mandi, Jammu, was analyzed.

(vi) Two samples of mud-plaster from Ajanta, Caves 16 and 17, Maharashtra, were analyzed for their chemical constituents.

(vii) Two plaster samples from Begampuri Masjid, New Delhi, were chemically analyzed,

(viii) One sample from Mir Ashraf Khan, Jama Masjid Chowk, Patna, was analyzed.

(ix) The nature of binding medium between two spherical glass pieces collected from the Sheesh Mahal, Mubarak Mandi, Jammu, was studied.

(x) Analysis of two samples of iron slag belonging to megalithic culture from Tenwala, District Quilon, Kerala, were carried out.

(xi) Three sandstone samples from Sun Temple, Modhera, Gujarat, were analyzed for their physical/chemical properties.

(xii) Dust fall samples collected at Red Fort, Delhi, were qualitatively and quantitatively analyzed.

(xiii) Three sandstone samples from Rani-ki-Vav, Patan, Gujarat, were analyzed for their chemical constituents. Certain physical parameters were also measured.

(xiv) Samples from Iron pillar, Dhar, Madhya Pradesh, were chemically analyzed. Metallographical studies were also carried out for the study of microstructure and to establish relation between alloy composition and anticorrosive properties (pls.LXXIII B-C and LXXVI).

(xv) After identifying the characteristic accretions (Oolytic type) on the carved surface of Rani-ki-Vav, Patan, Gujarat, experiments were carried out for the selection of effective and safe method of removal of their accretions.

(xvi) Scientific studies were carried out for the use of oxalic acid for the patination of marble surface in improving the lusterous surface.

(xvii) Experiments were carried out on the use of certain natural additives (Manjuphal, Jagery etc.,) in lime-mortar/plaster to understand effects of these additives on physical and mechanical properties of lime-mortar and plaster.

(xviii) Studies have been taken up for comparative evaluation of efficacy and suitability of preservatives in practice and different commercially available preservative for stone/terracotta.

(xix) Experiments were carried out to study the use of merculla clay as consolidant of mud-plaster with reference to conservation work of Buddhist monasteries of Ladakh and Tabo.

XI. ARCHAEOLOGICAL GARDENS'

ANDHRAPRADESH

1. ARCHAEOLOGICAL MUSEUM, AMARAVATI.— During the year under review, the water supply systen in the museum garden was introduced by sinking a bore-well (dia 150 mm) apart from installing a pump-set.

2. NAGARJUNA UNIVERSITY, ANUPA, DISTRICT GUNTUR.— The work of developing a garden around the University (reconstructed area) was taken up by making arrangements for water supply.

BIHAR

3. ARCHAEOLOGICAL MUSEUM, BODHGAYA.— The garden around the museum has been maintained properly.

4. ARCHAEOLOGICAL MUSEUM, VAISHALI.— The garden in front of the museum has been maintained.

GOA

5. BOM JESUS, VELHA GOA.— During the year, the work of relaying the lawns in the main complex including the Church has been taken up.

KARNATAKA

6. MALLKARJUNA TEMPLE-COMPLEX, PATTADAKAL, DISTRICT BUAPUR.— The work of developing a garden in the area adjoining the temple-complex has been undertaken during the year under review.

7. JAINA AND KEDARESVARA TEMPLE, HALEBID, DISTRICT HASSAN.— The work of sinking a bore-well (dia 150 mm) and installing a pump-set has been completed.

MAHARASHTRA

8. DAULATABAD FORT, DISTRICT AURANGABAD.— The landscape gardening around the Rashid Bagh area has been developed.

9. ELLORA CAVES, DISTRICT AURANGABAD.— The efforts were made to develop the water supply system for improving the landscaping in the area adjacent to the caves.

' Information from: 1-2, 5-9 and 11 Horticulture Division III, Mysore; 3-4, Museum Branch; 10, 16-17, Horticulture Division IV, Bhubaneswar; and 12-15, Horticulture Division I, Agra, of the Horticulture Branch of the Survey.

ORISSA

10. KHANDAGIRI AND UDAYAGIRI CAVES, DISTRICT BHUBANESWAR.— The work of tree plantation is in progress. A deep tube-well was provided besides procuring a submersible pump.

TAMIL NADU

11. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.— During the period under review, relaying of garden in and around the temple has been completed in all respects.

UTTARPRADESH

12. FATEHPUR SIKRI, DISTRICT AGRA.— In order to improve the garden, a bore-well was sunk. A pipe-line Was laid to connect the same with the main pipe-line to augment the water supply in the garden.

13. KHANE-ALAM NURSERY, DISTRICT AGRA.— The damaged sprinkler system was repaired in **the** conservatory and the re-orientation of glass-house was done to accelerate propagation in the base nursery.

14. TAJ MAHAL COMPLEX, DISTRICT AGRA.— Arrangements were made to provide uninterrupted power supply to the pump set for proper maintenance and improvement of the garden.

15. STUPA REMAINS, SARNATH, DISTRICT VARANASI.— A 63 KVA transformer was installed to overcome the problem of shortage of electricity, to improve the water supply to the garden which was affected badly due to regular fluctuation of power.

WESTBENGAL

16. RAJBARI PALACE, DISTRICT COOCH BEHAR.— Electric pump-set was installed after deep boring of a tube-well. Laying of PVC pipe-line is in progress.

17. KATRA MOSQUE, DISTRICT MURSHIDABAD.— A deep bore-well was provided to maintain the garden properly.

XII. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

1. INDIAN ARCHAEOLOGY-A REVIEW.— Two issues for the year 1989-90 and 1990-91 have been published.

2. MEMOIRS OF THE ARCHAEOLOGICAL SURVEY OF INDIA.— During the year under review, three excavation reports were published. These are No. 90, *Excavation at Kaveripattinam* by K. V. Soundara Rajan; No. 92, *Excavation at Malvan* by J. P. Joshi; No. 93, *Excavation at Sannathi* by James Howell and Others and No. 94, *Excavation at Piprahwa and Ganwaria* by K. M. Srivastava has been sent to press.

3. NEW IMPERIAL SERIES.— Four issues were reprinted *viz., The Sharqi Architecture ofJaunpur* by A. Fuhrer; *Monumental Remains of the Dutch East India Company, in the Presidency of Madras* by Alexander Rea; *List of Architectural and Archaeological Remains in Coorg* by Alexander Rea; and *Chalukyan Architecture including examples from the Bellary District, Madras Presidency* by Alexander Rea.

4. SPECIAL PUBLICATIONS.— Two brochures *viz.,* India's Freedom Struggle - An Overview and Salimgarh were brought out by the Survey to mark the inauguration of the Swatantrata Sangrama Sangrahalaya.

OTHER PUBLICATIONS

1. ANDHRA PRADESH.— The following Research Publications were released by the Salar Jung Museum : *Bi-Annual Research Journal,* Vol. XXIH-XXIV (1986-87); XXV-XXVI (1988-89) and XXXI-XXXII (1994-95); two Monographs on the *Astronomical Instruments in the Salar Jung Museum* by S. R. Sarma and *Indian Bronzes in the Salar Jung Museum* by D. N. Varma.

2. KARNATAKA.— The Directorate of Archaeology and Museums, Government of Karnataka, Mysore, brought out the following publications *viz., Panchatantra in Karnataka Sculpture; Irrigation systems under Vijayanagara; Sesha-Chandrika; Hampi: the Fabled Capital of Vijayanagara Empire* (English), *Inscriptions ofVijayangara (Hampi); Epigraphy, Numismatics and other aspects from Karnataka; Studies in Karnataka Numismatics;* and *Antiquities in the Government Museum,* Shimoga.

3. RAJASTHAN GOVERNMENT MUSEUM, AJMER —The Department of Archaeology and Museums Government of Rajasthan prepared a brochure of the Museum and published a Catalogue of Inscription.



A

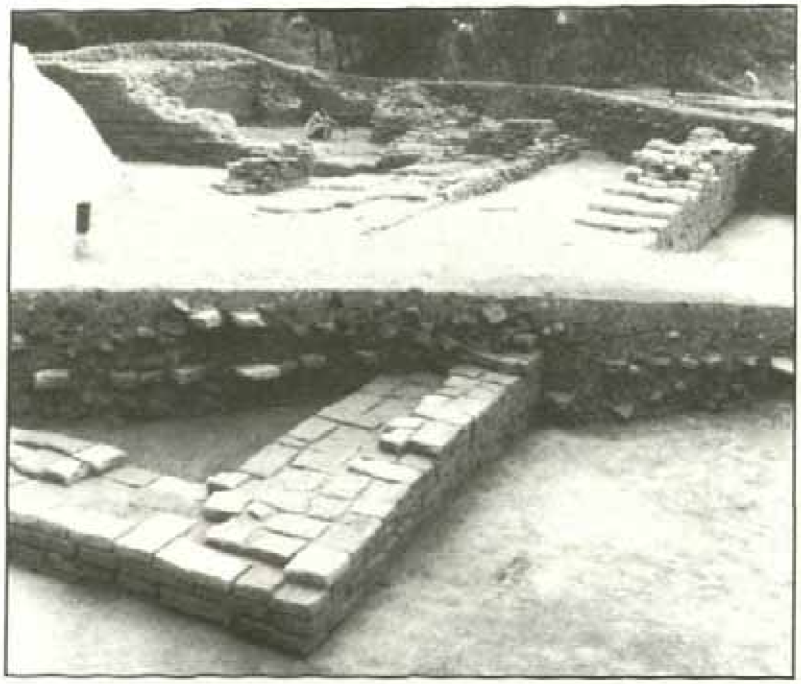


B



C

A, *Puduru : general view of structures;* B-C, *Gomsi : view of the site and the excavation. See pp. 2-3*



A

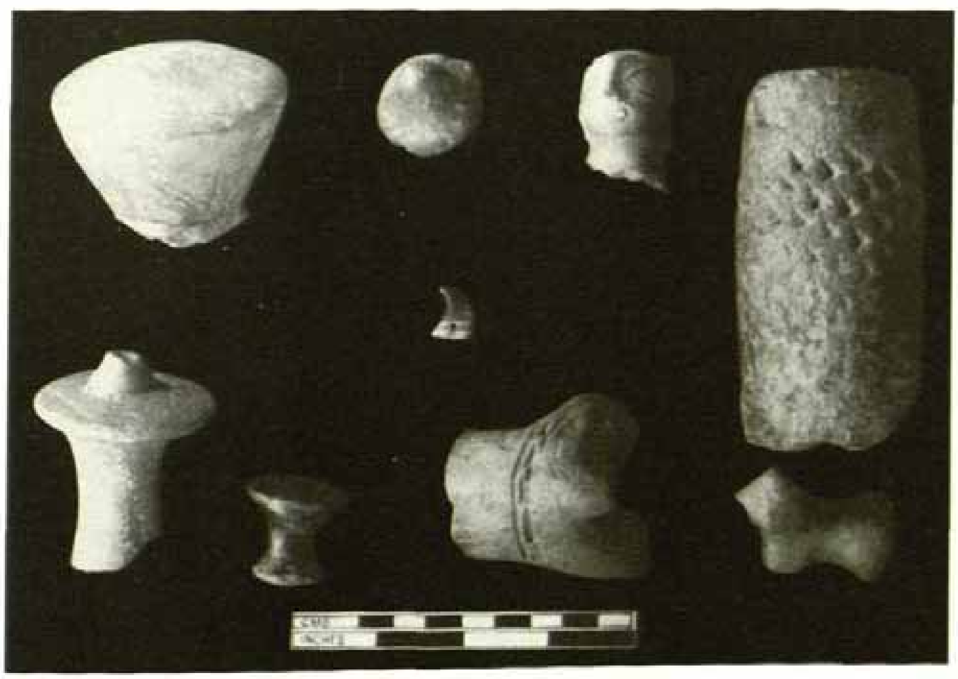


B

A. *Shri Surjyapahar : monastic-complex;* B. *Maner: polished stone tools and objects of terracotta, Period II.* *See pp. 3 and 5*

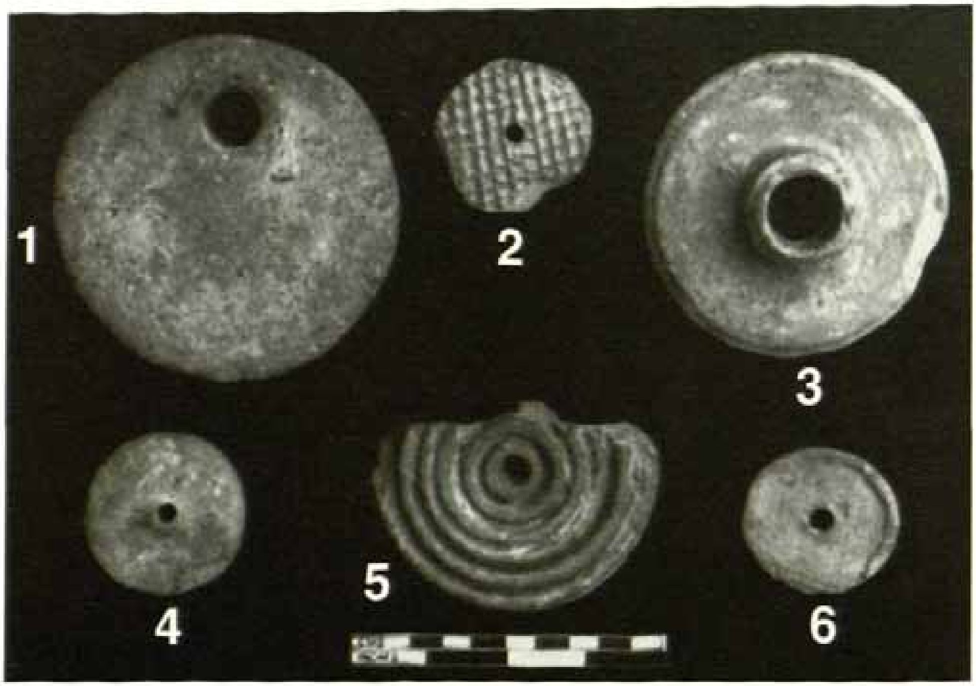


A

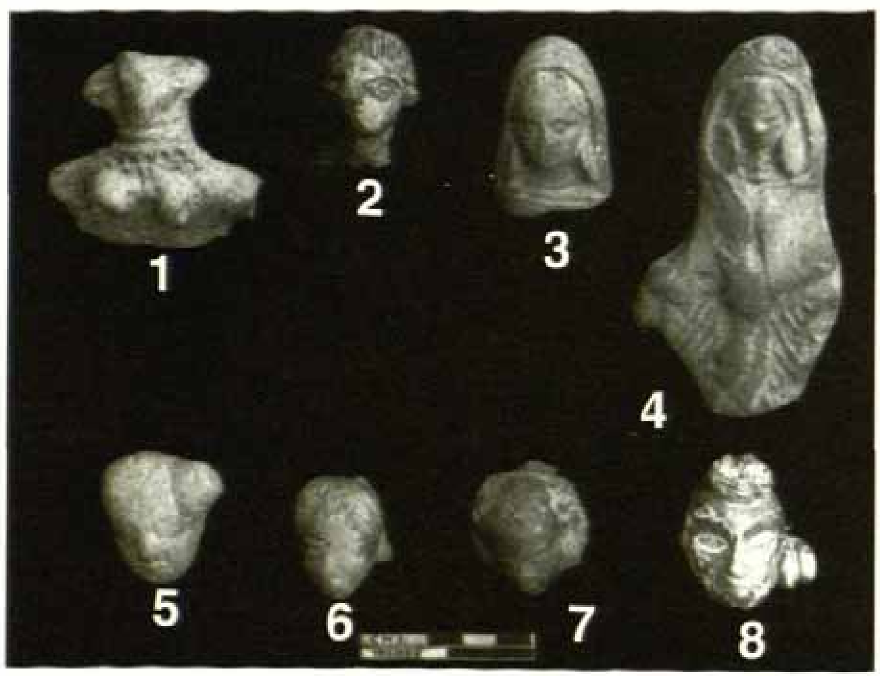


B

Maner : A, terracotta figurine, Period III; B, miscellaneous finds, Period IV. *See p. 5*

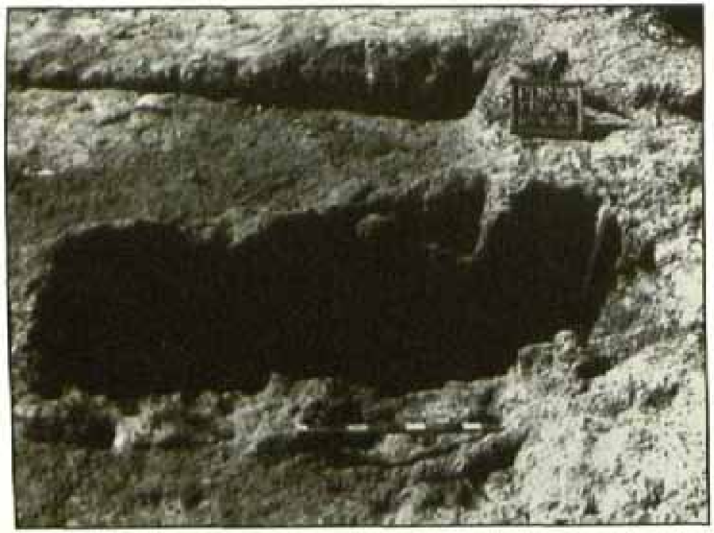


A

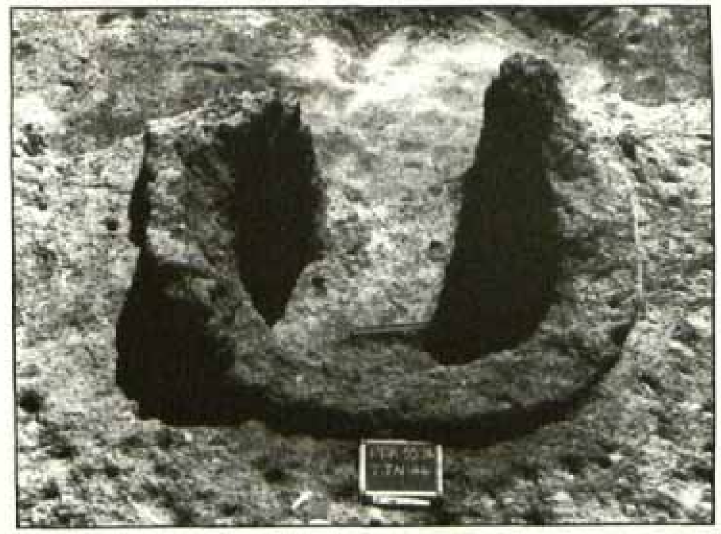


B

Ramchaura : A, *terracotta wheels and miscellaneous objects, Period I;* B, *human figurines (1,2 and 8), Period I and (3-7), Period II.* *See p. 6*



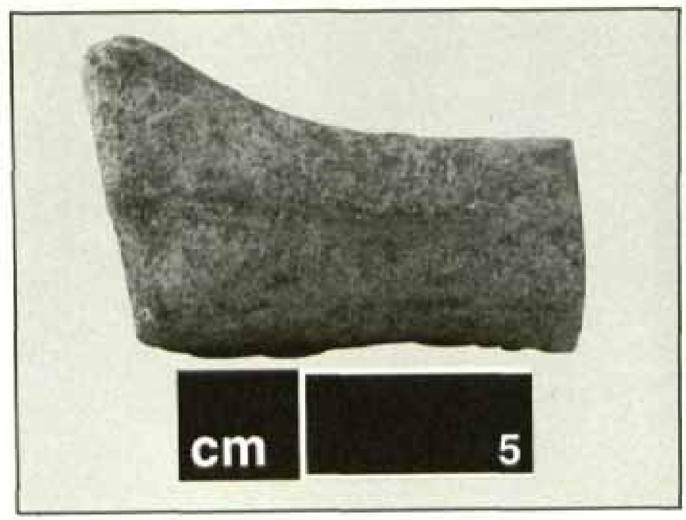
A



B



C

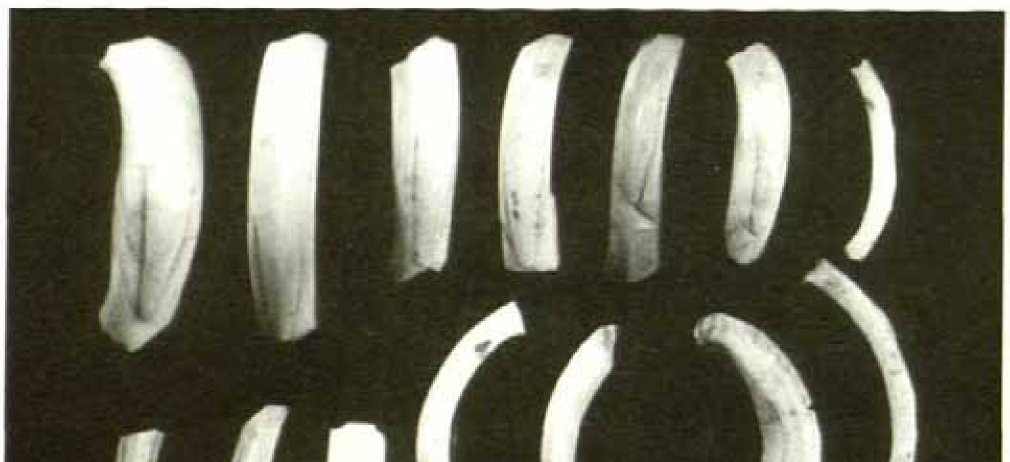


D

Padri : A, apsidal kiln : B, circular kiln, Harappan level; C, rectangular mud structure; D, bead polisher, early Harappan. See p. 11

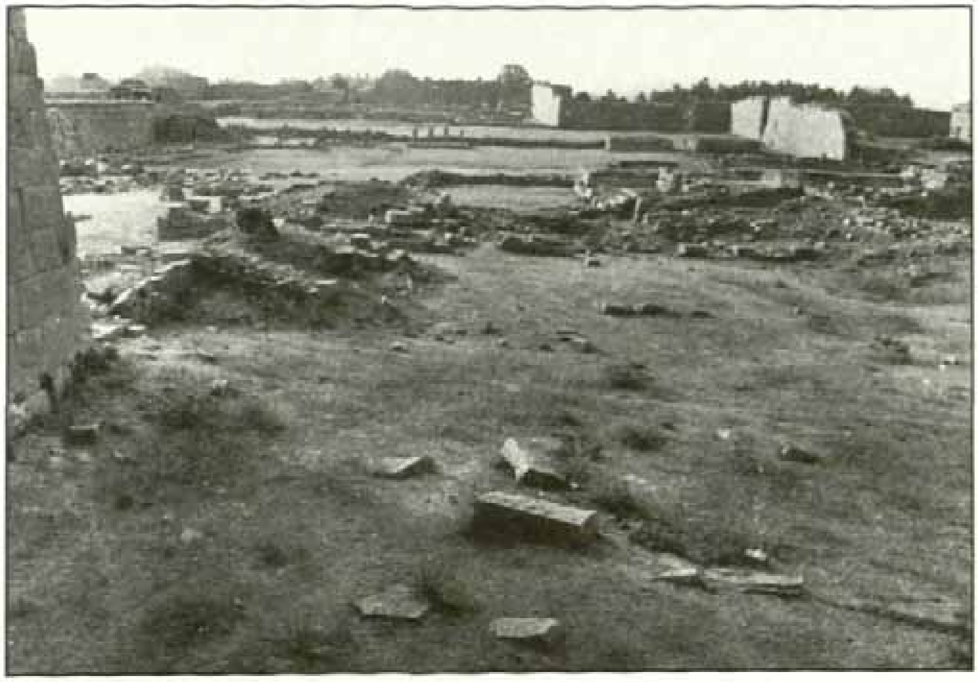


A

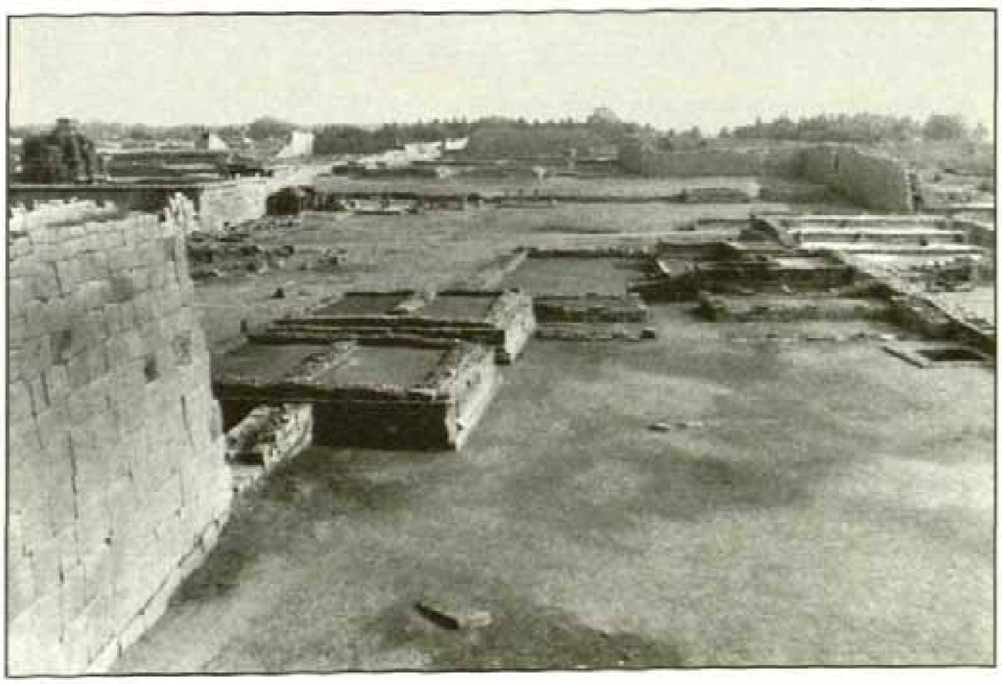


B

Bagasra : A, *terracotta sealing*; B, *shell bangles. See p. 18*



A



B

Harihararaya's Palace, Hampi : A, *before and* B, *after excavation. See p.* 26



A

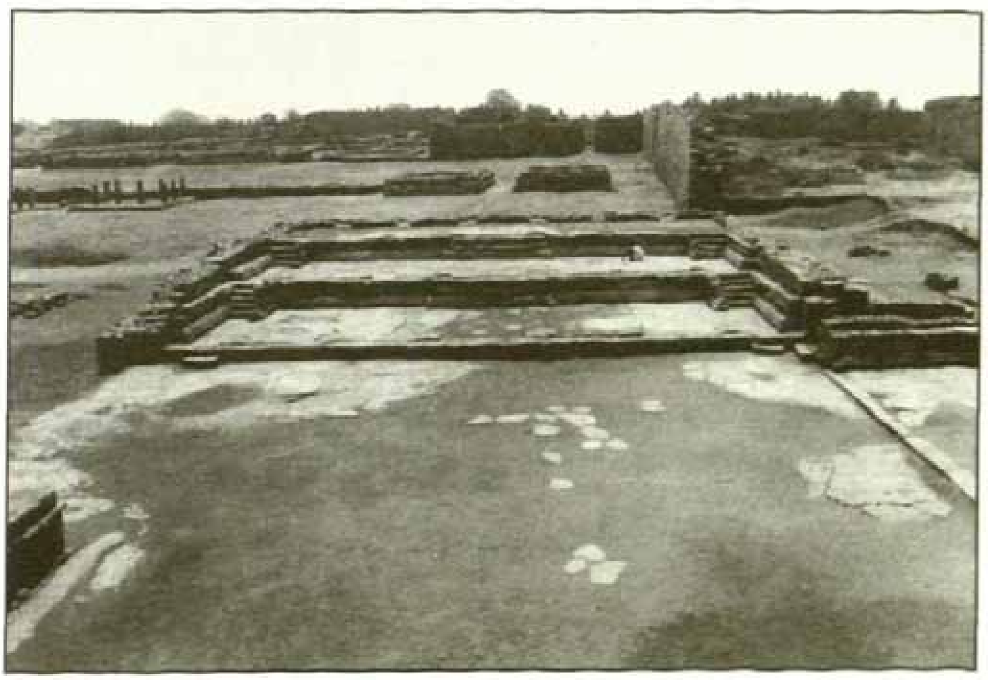


B

Royal Garden, Harihararaya's Palace, Hampi : A, *before and* B, *after excavation. See p. 26*

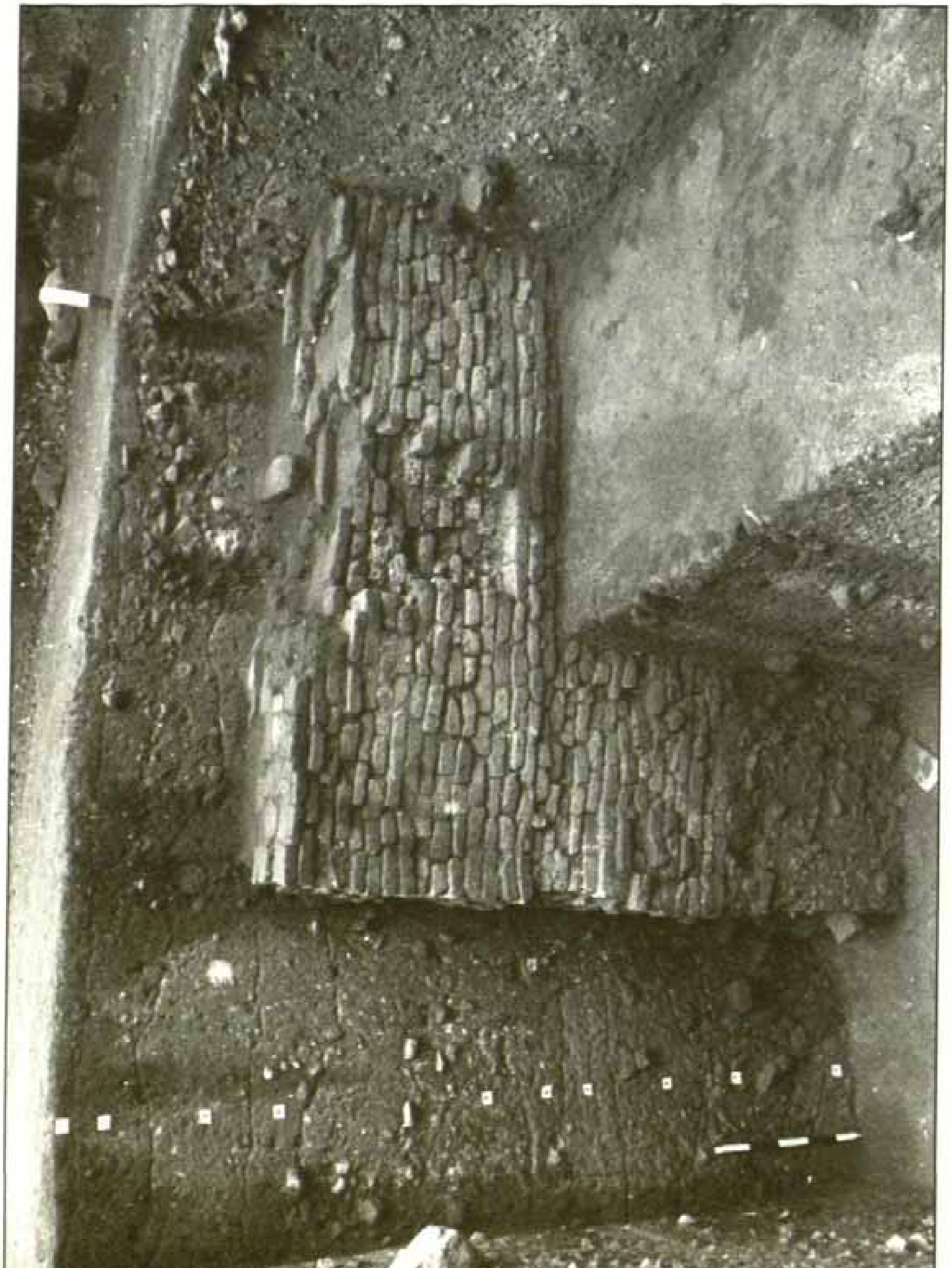


A



B

Royal Court, Harihararaya's Palace, Hampi : A, *during excavation;* B, *after excavation and preservation. See p. 28*



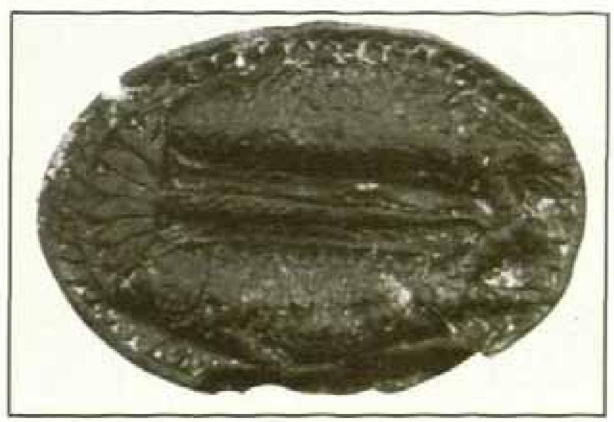
Banavasi : brick-wall, post-Kadamba. *See p. 42*



A

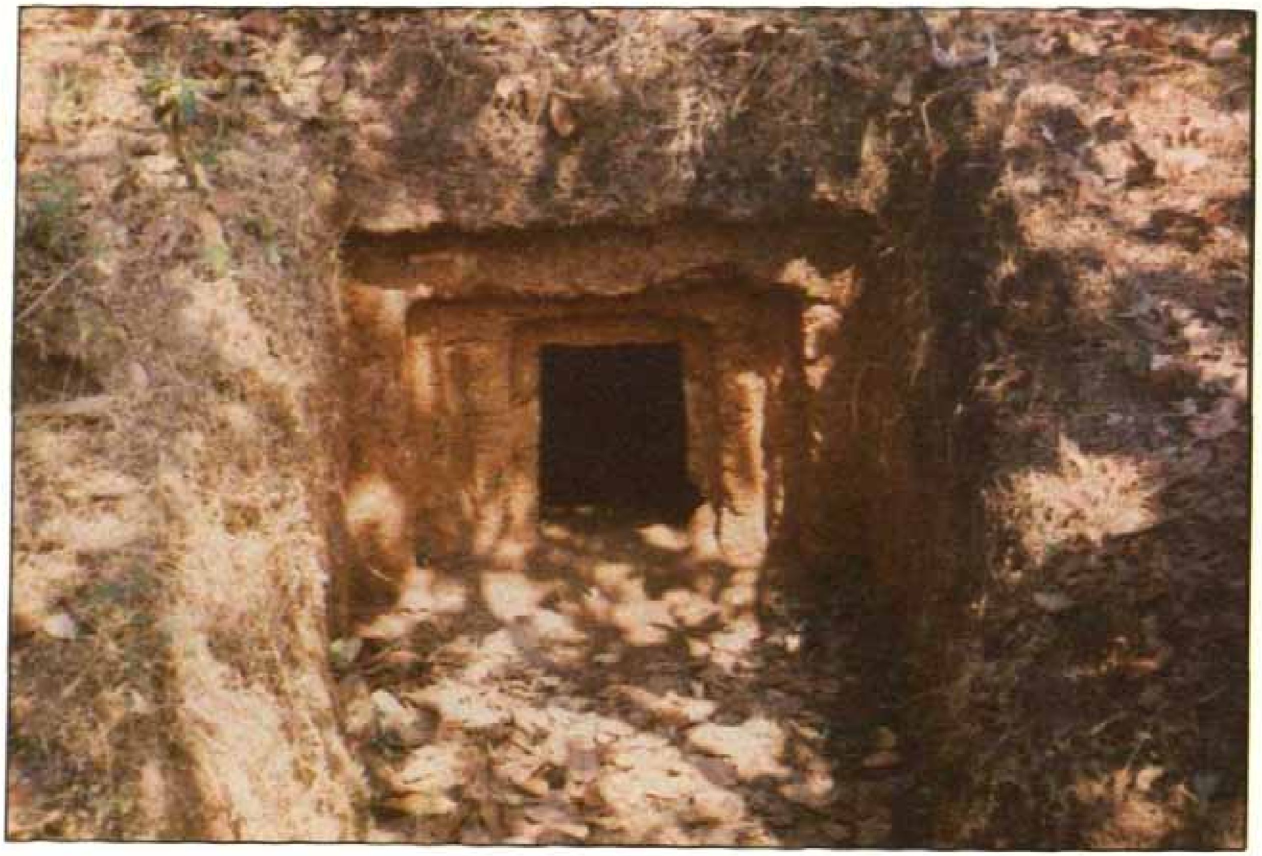


B



C

Banavasi : A, *head of Bodhisattva;* B, *ram-headed seal;* C, *seal with fish design.* *See p. 44*



A

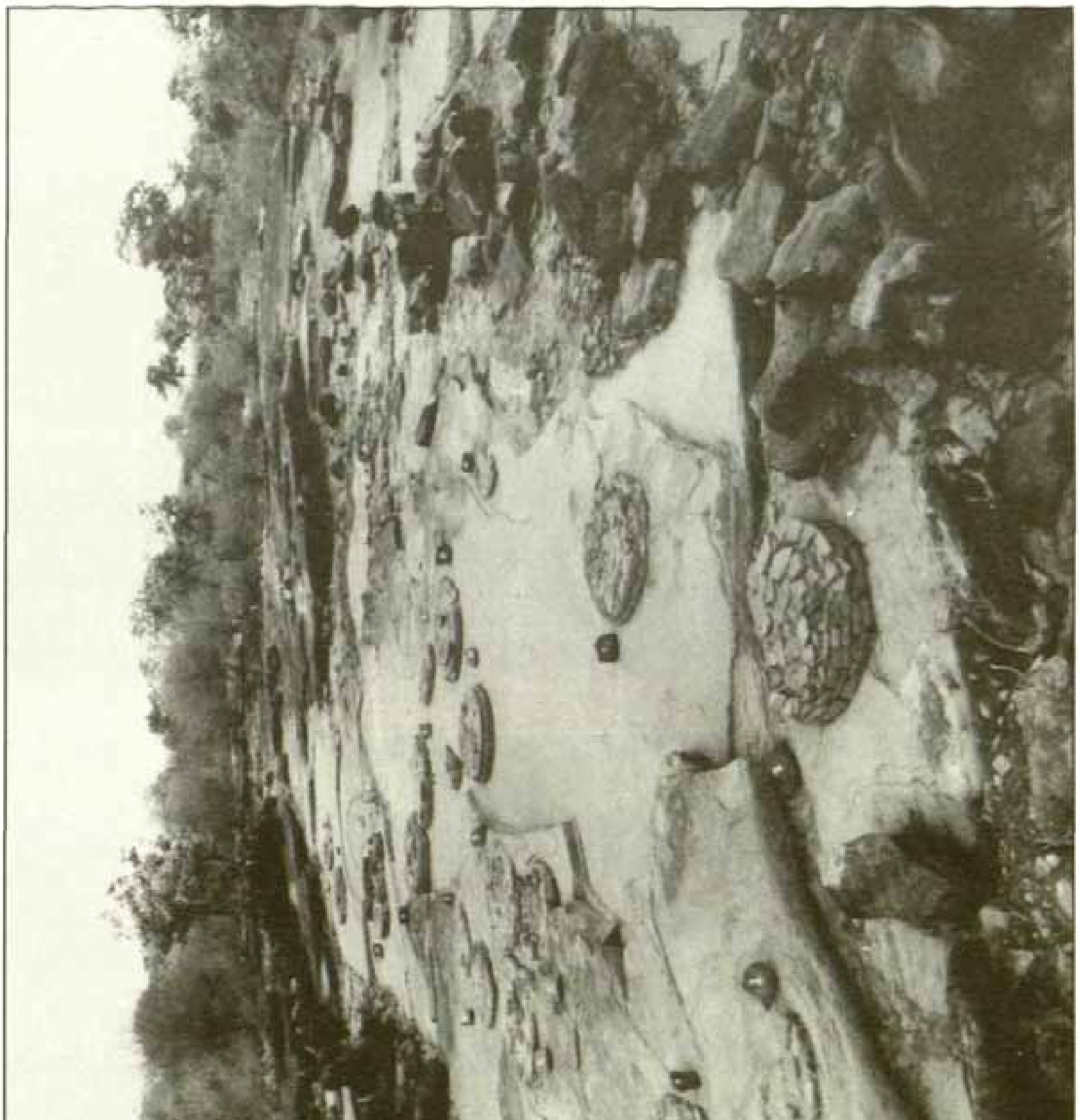


B



C

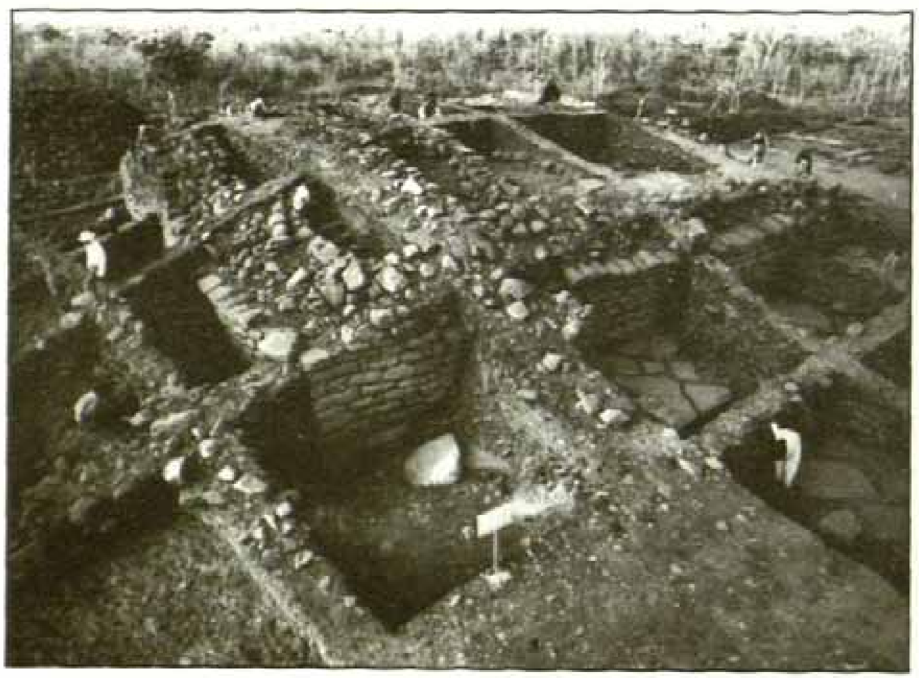
A, *Kotturvayal : laterite rock-cut caves;* B-C, *Abhayagiri : Acheulian implements and menhirs.* *See pp. 45-46*



Sanchi : votive stupas near old pathway. *See p. 48*



A



B

A, *Sanchi : close view of the votive stupas;* B, *Satdhara : monastery (I).*
See pp. 48 and 50

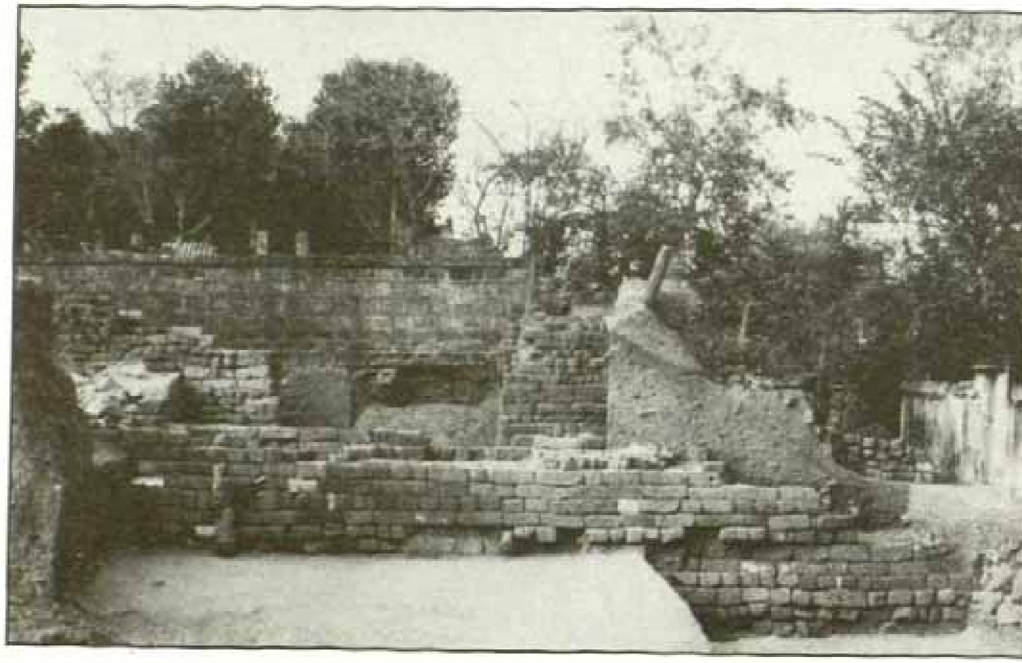


A



B

A. *Dhanuhi : rock-shelter;* B. *Khangabok : iron objects. See pp. 50 and 59*



A



B

Barabati Fort, Cuttack : A, *northern retaining-wall, inner face;* B, *homa-kunda, Period II. See p. 61*



A

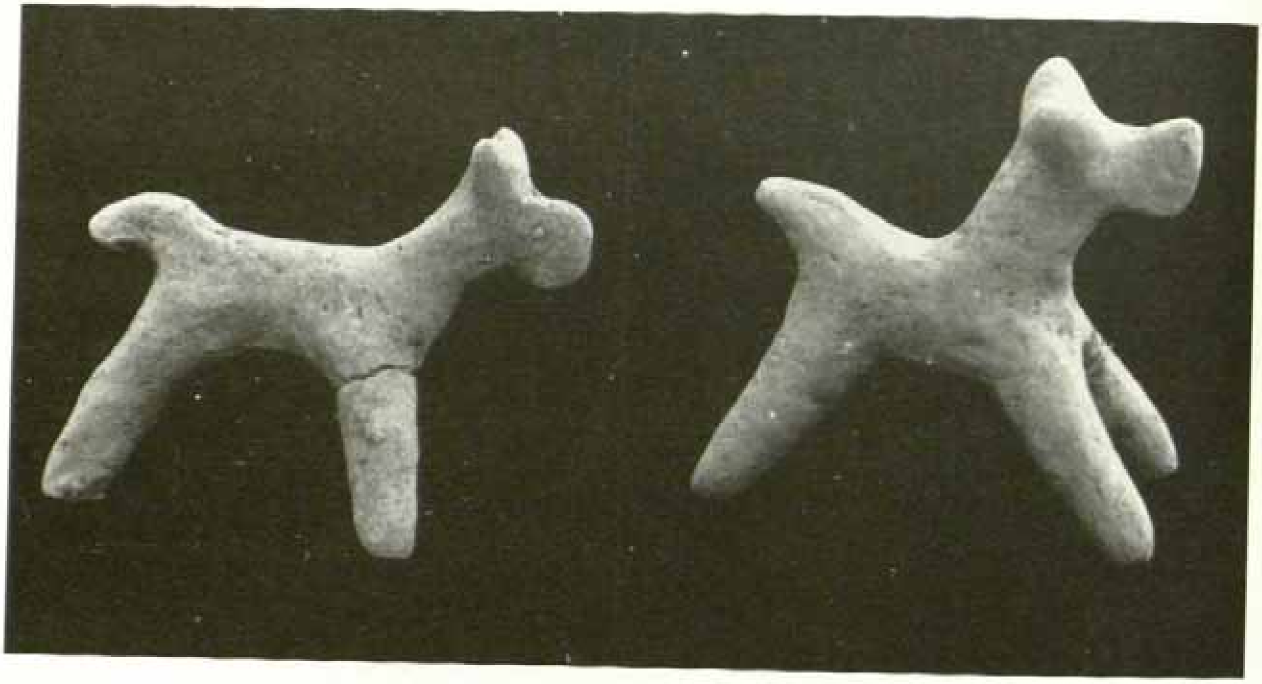


B



C

Barabati Fort, Cuttack : A, *n-shaped laterite structure;* B, *copper coin of Shah Alam II;* C, *female sculpture. See pp. 61 and 64*



A

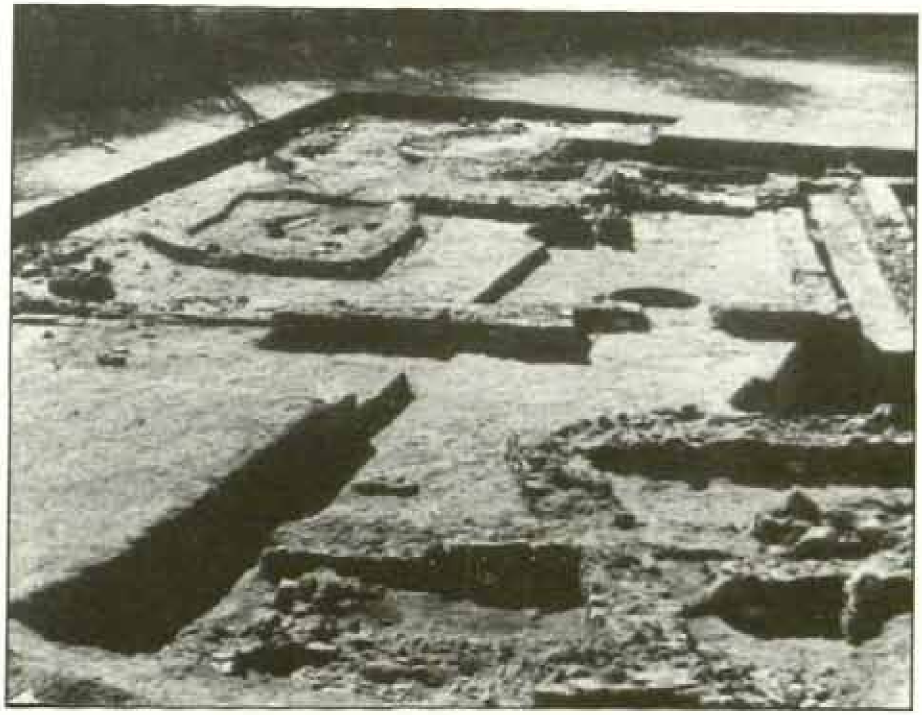


B

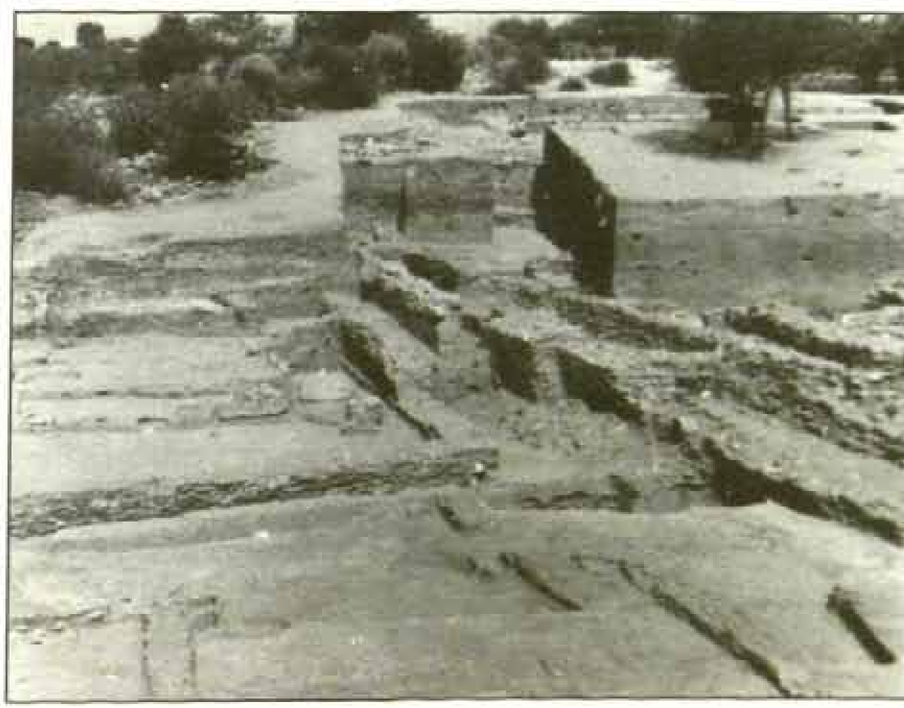


C

Barabati Fort, Cuttack : terracotta animal figurines. *See p. 64*



A



B

Balathal : A-B, *exposed structures. See p. 67*



A



B

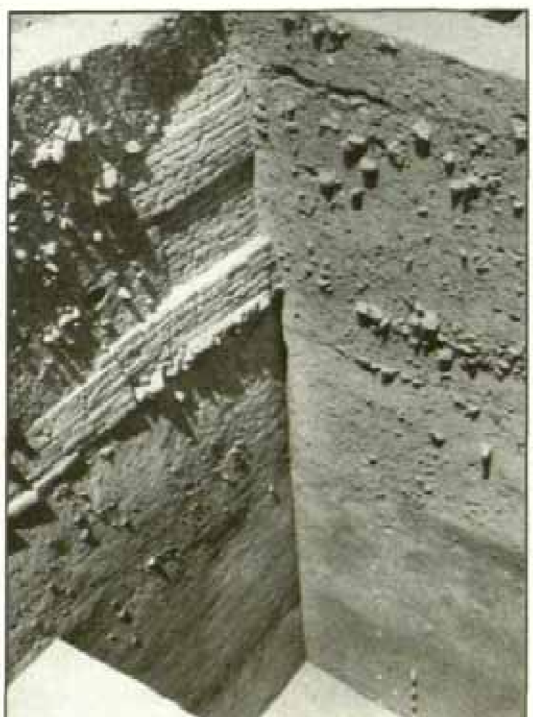


C

Balathal : A, *pottery-kiln with channels;* B, *terracotta embossed seal;* C, *terracotta drainage pipeline. See pp. 69-70*

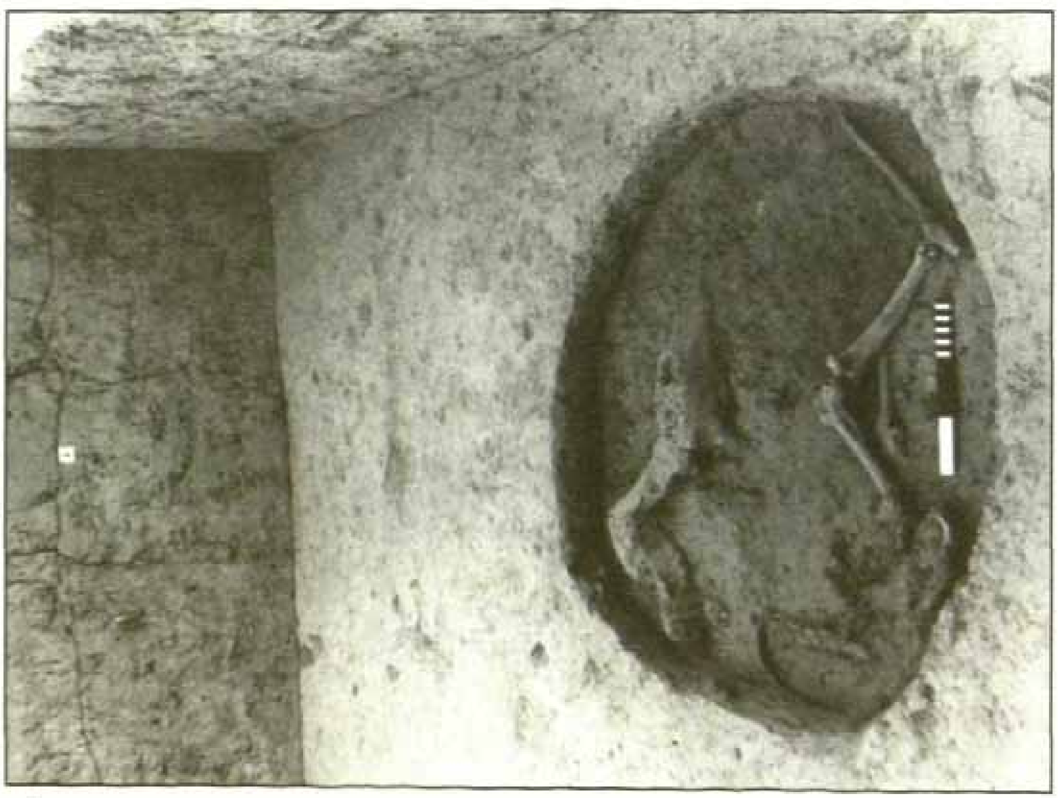


A



B

Sravasti : A, *exposed house-complex;* B, *western section of index-trench. Area C. See p.76*



A



B

Siswania : A, animal pit-burial, Sunga; B, Kushan brick-floor and late deposits. See p. 83



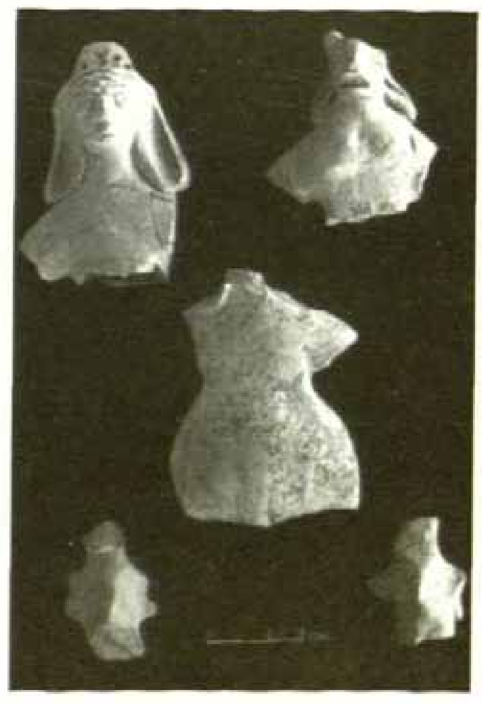
A



B



C

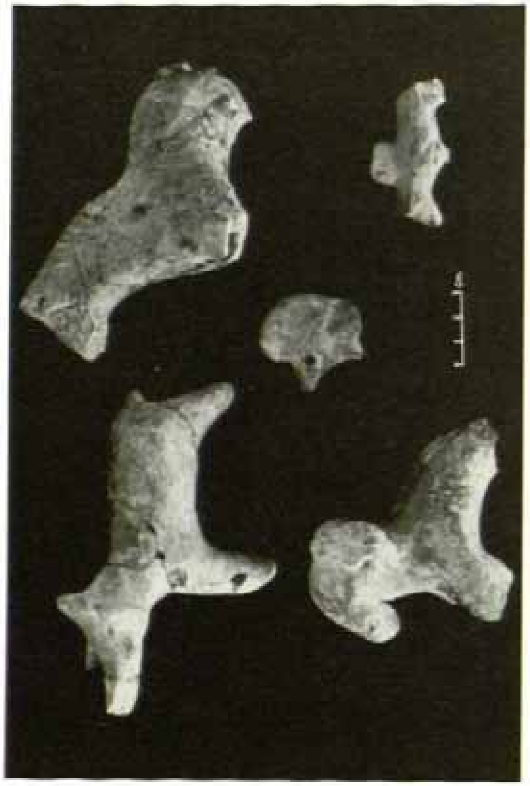


D

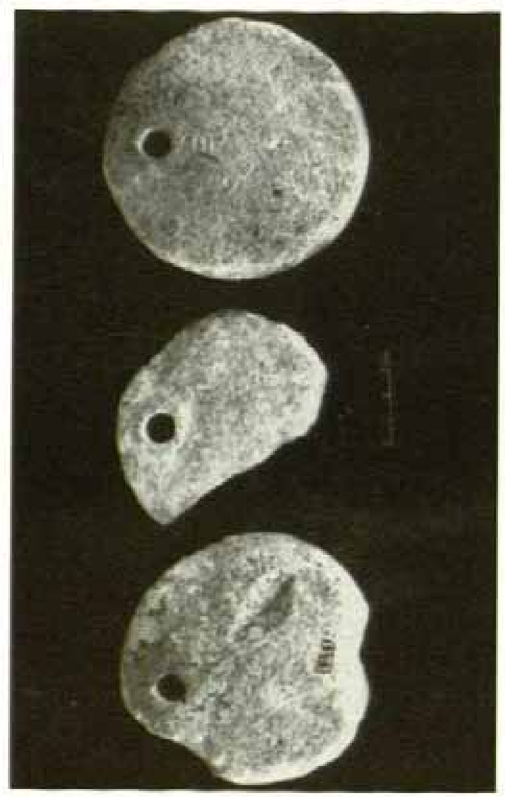
Siswania : A, B and C, *terracotta plaques showing female figurines and a mithuna. Sunga;* D, *Naigamesa and Naigamesi, Kushan.* *See p. 85*



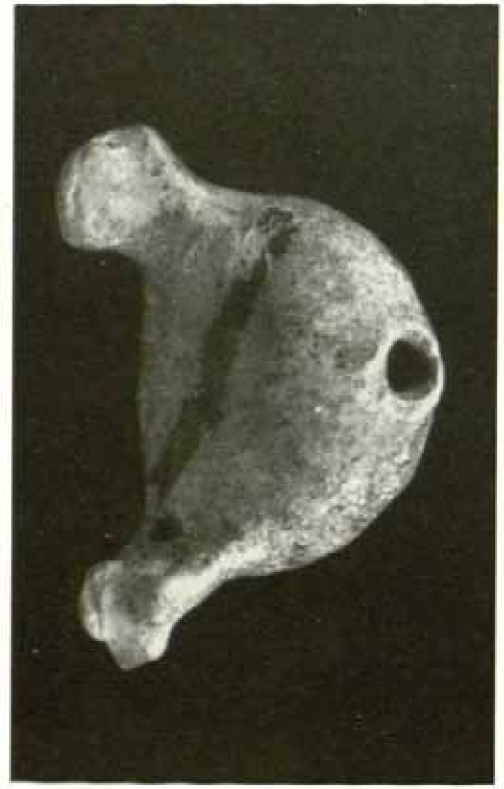
A



B

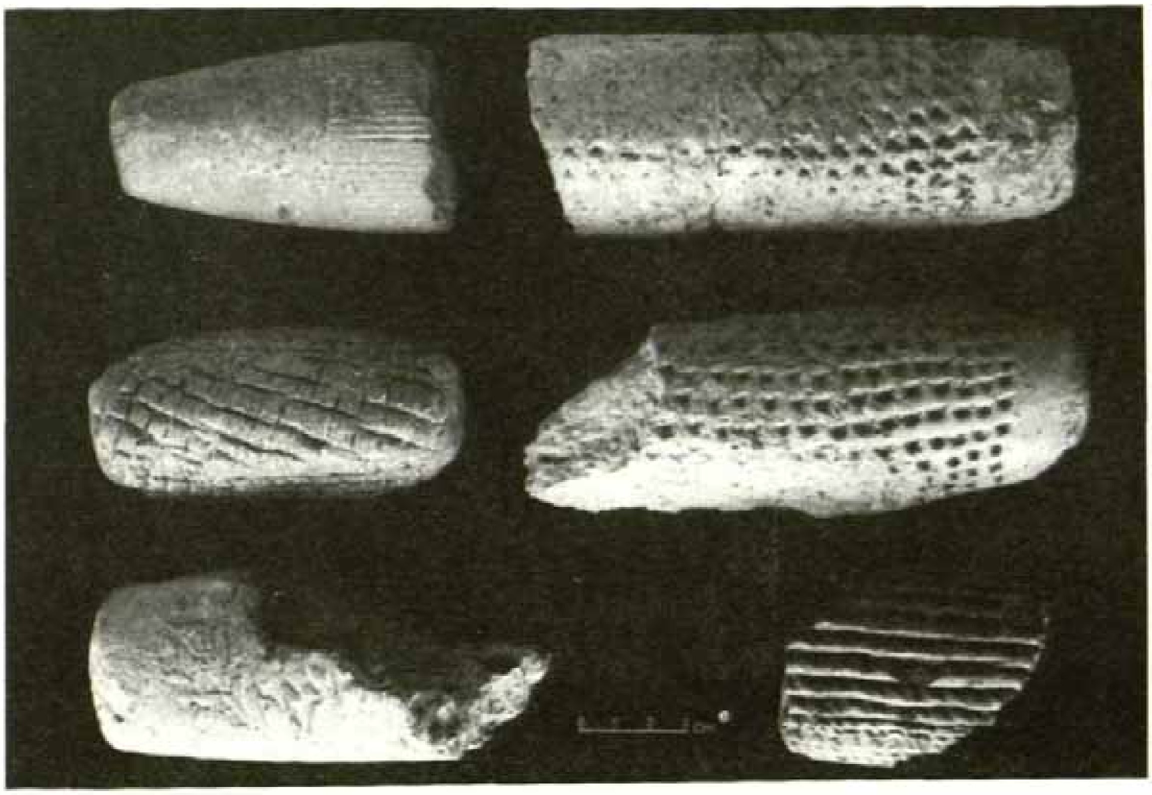


C

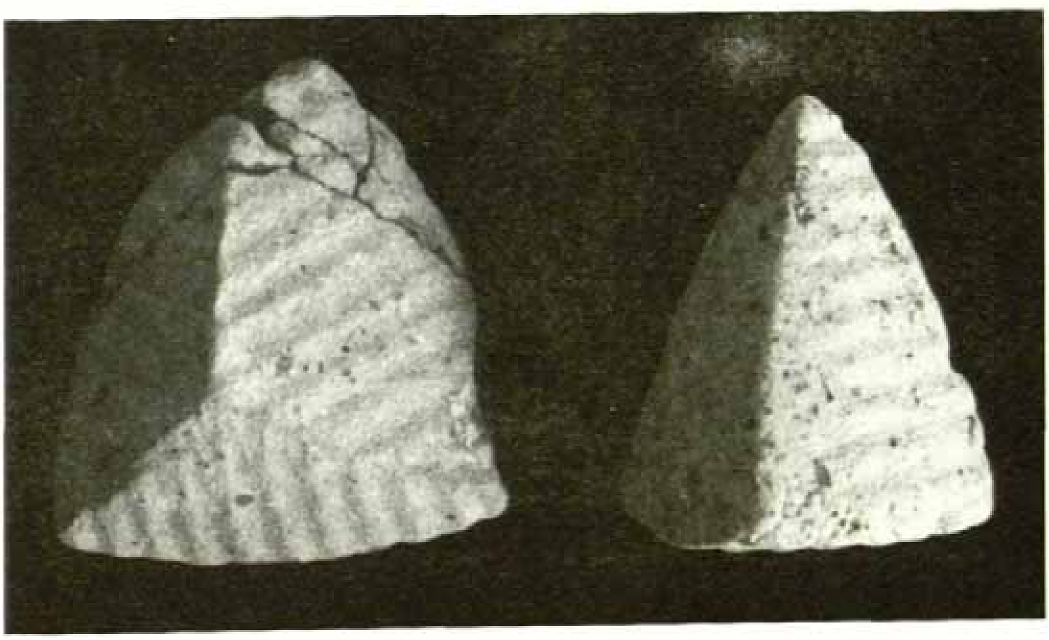


D

Siswania : A, *terracotta heads, Kushan;* B, *animal figurines;* C, *pendants and* D, *toy-cart.* *See p. 85*



A



B

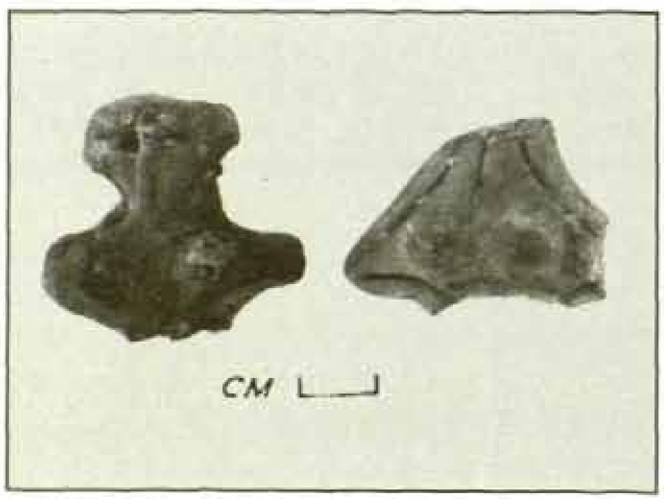
Siswania : A, *terracotta pestles;* B, *prizm-shaped objects. See p. 85*



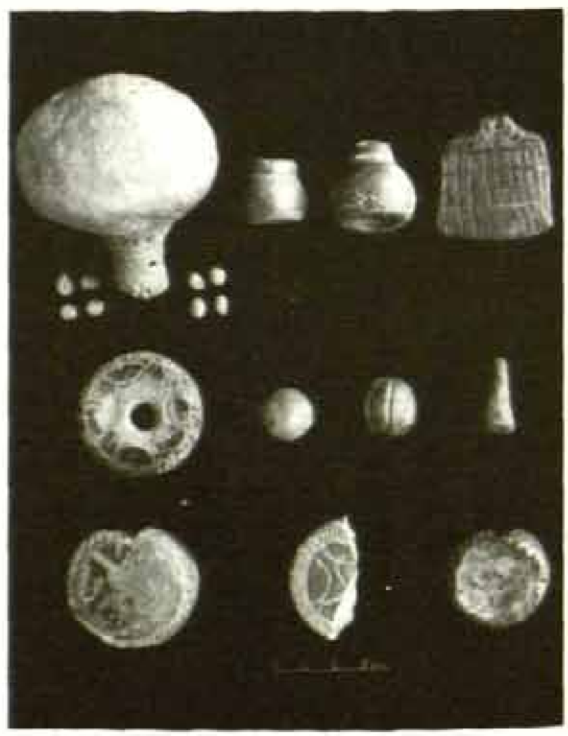
A



B

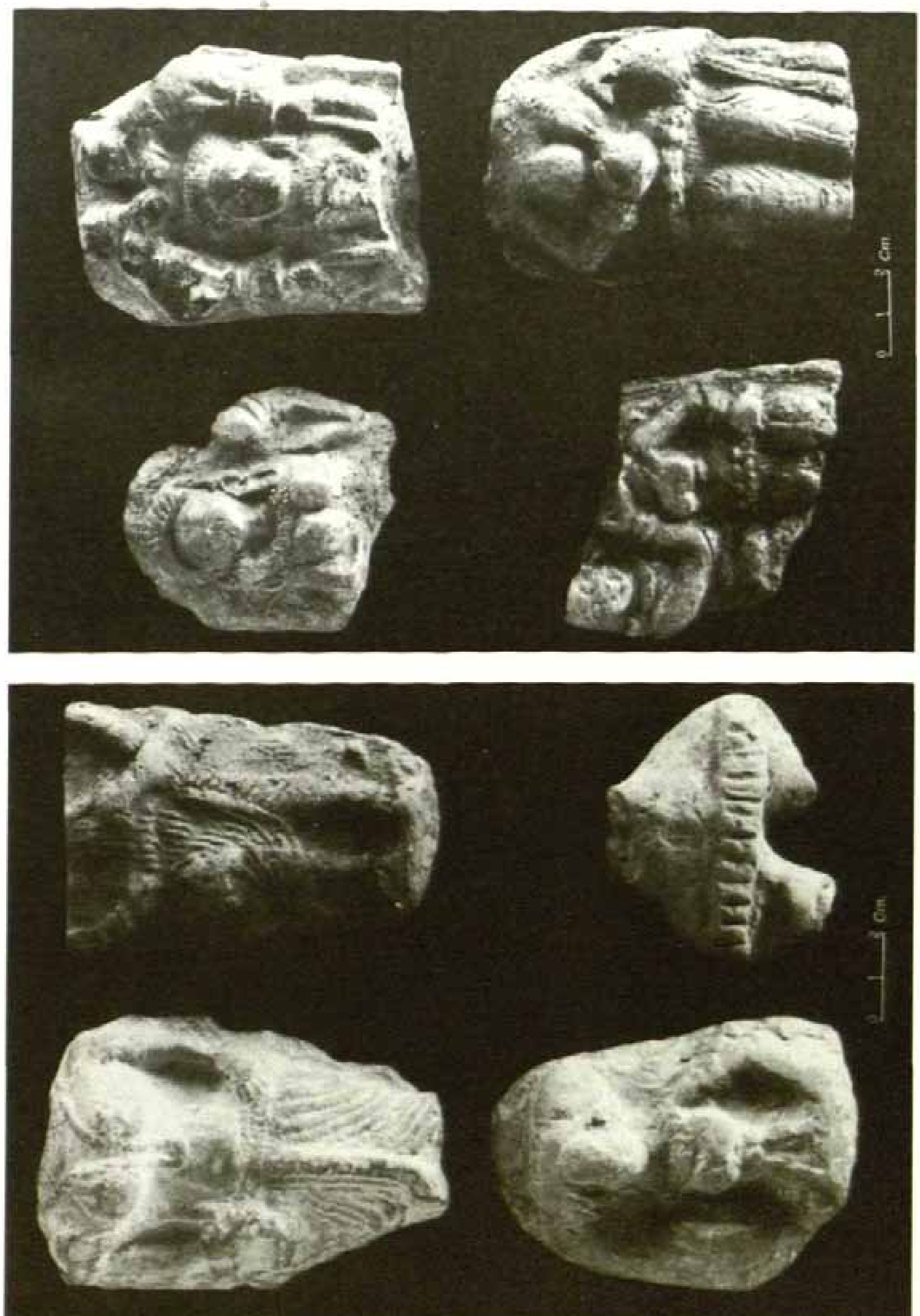


C



D

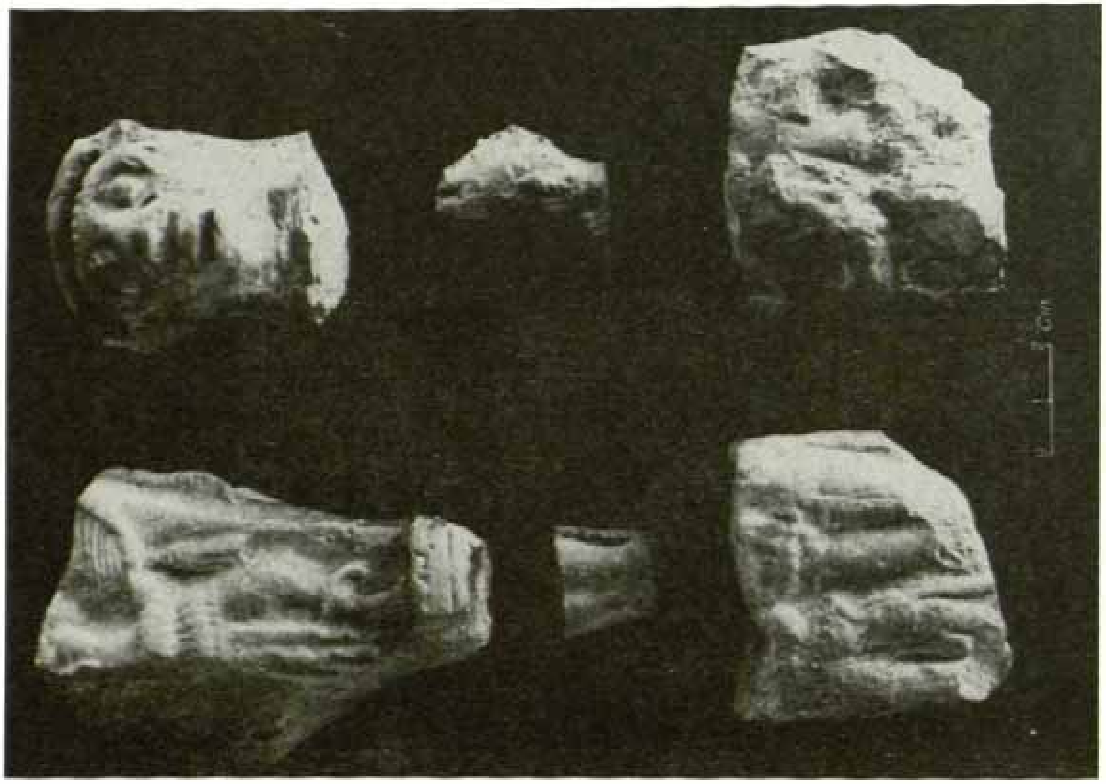
A, *Jignadham: icon of Vishnu;* B, *Buddhi Khas : yakshi; C-D, Sankisa: terracotta mother goddess and miscellaneous objects, PGW level.* *See pp. 86 and 91*



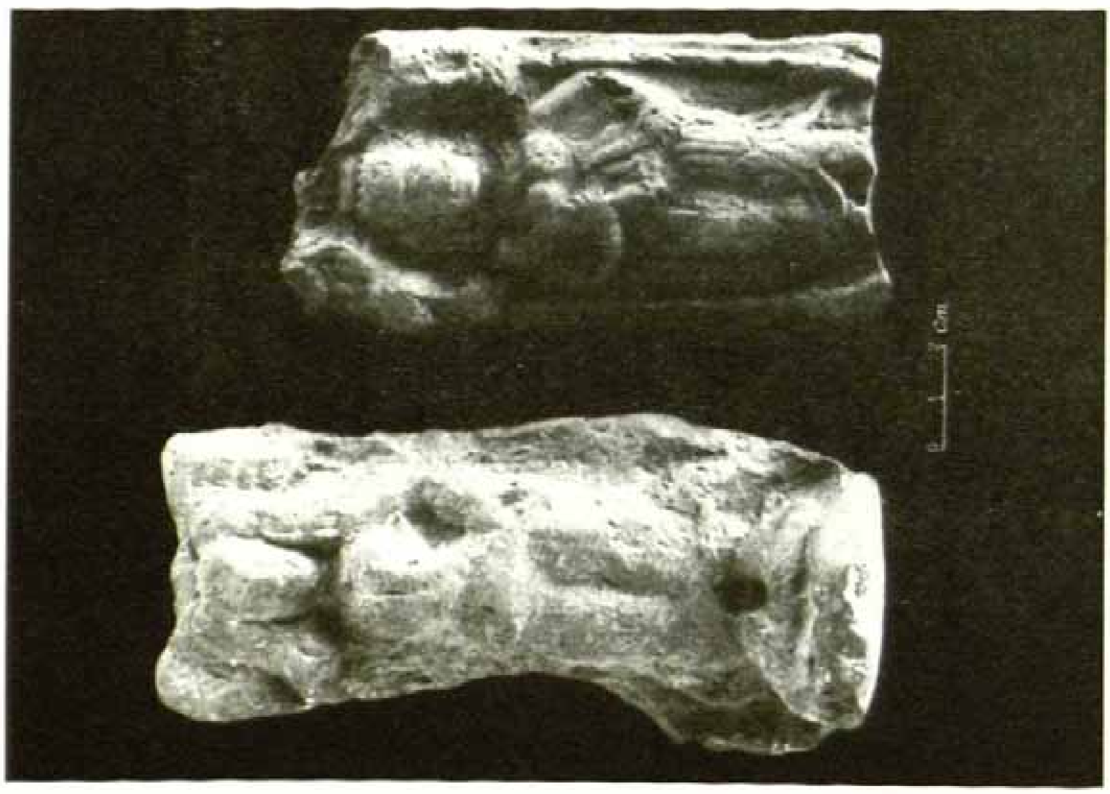
B

A

Sankisa : terracotta plaques. A, Maurya-Sunga and B, Sunga. *See p. 96*

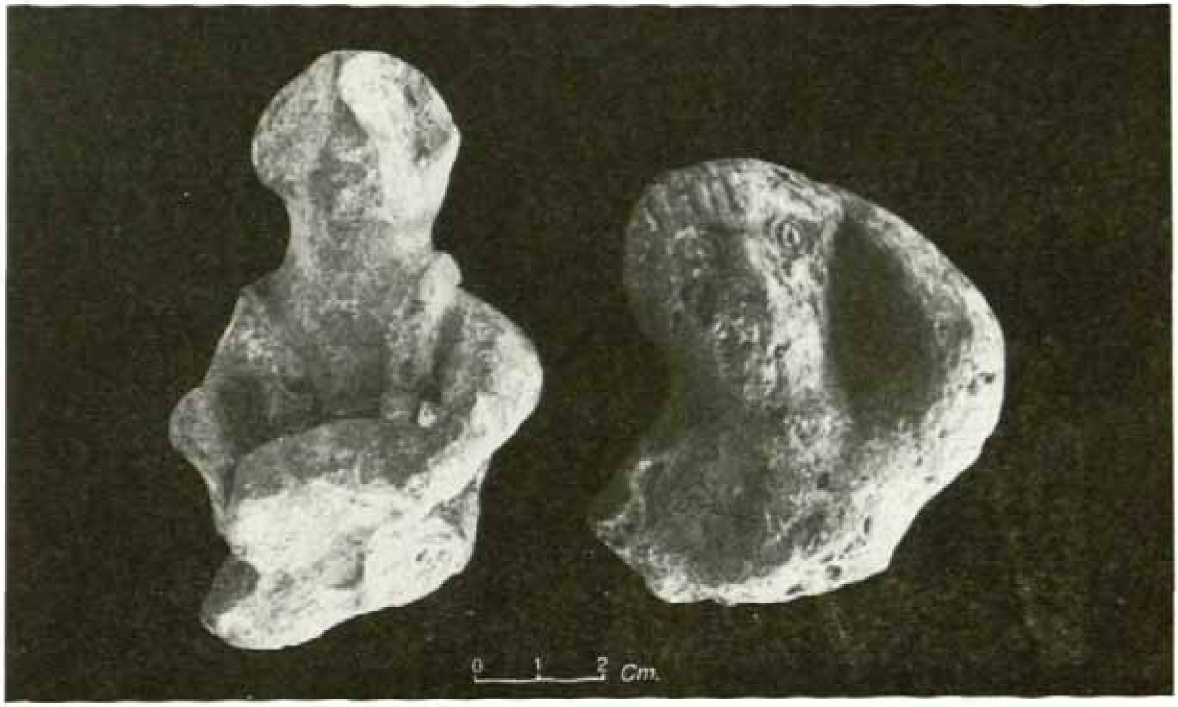


B

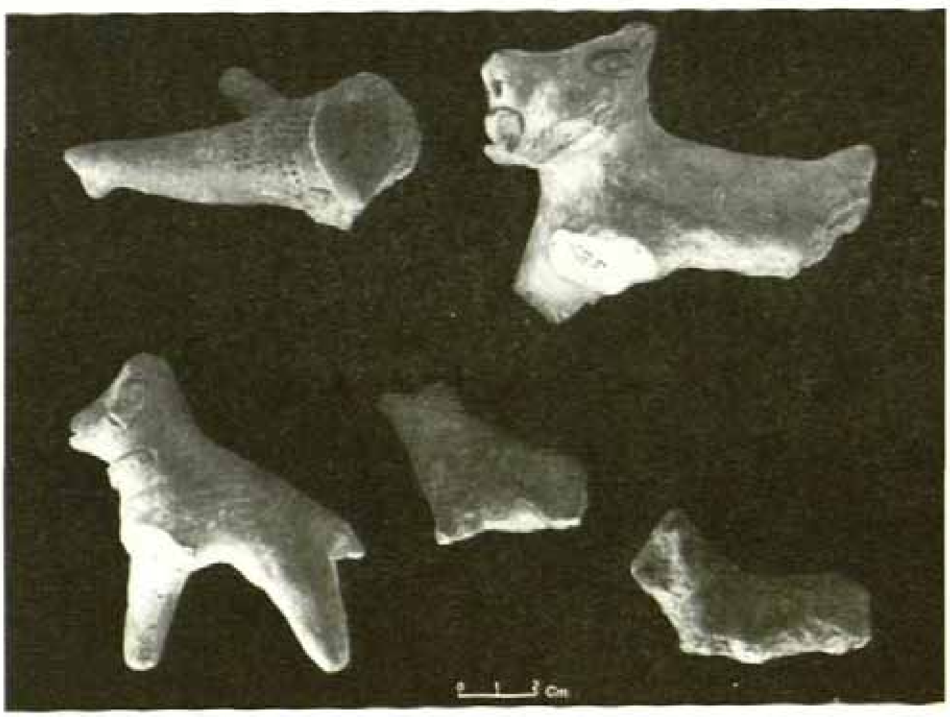


A

Sankisa : A-B, *terracotta plaques, Sunga.* *See p. 96*

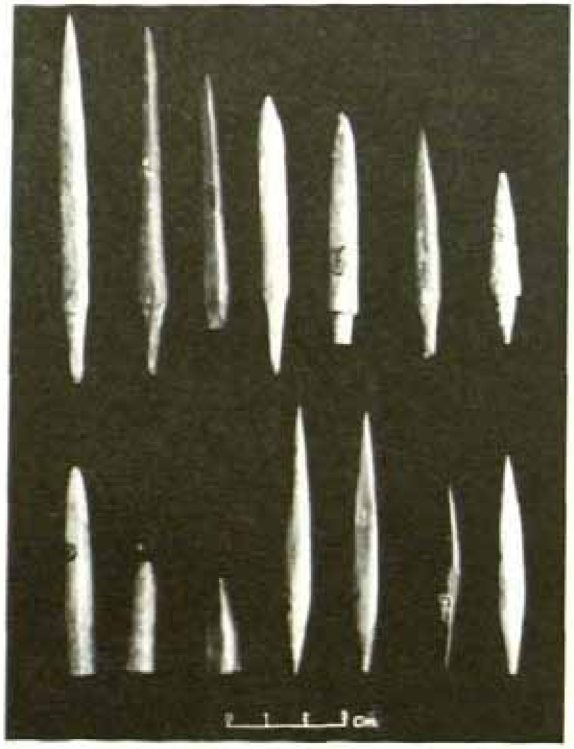


A

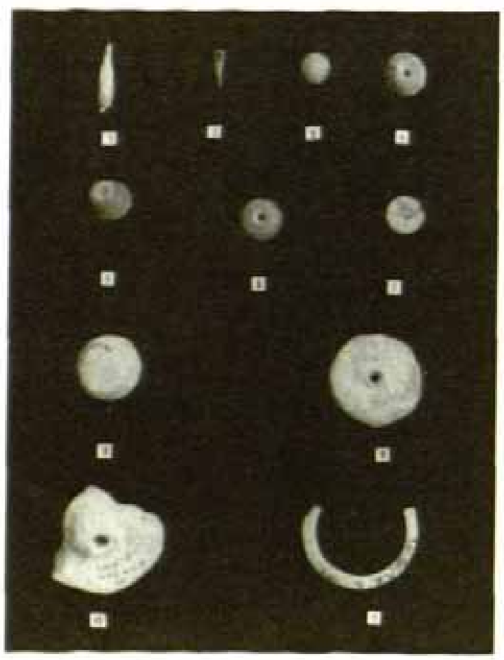


B

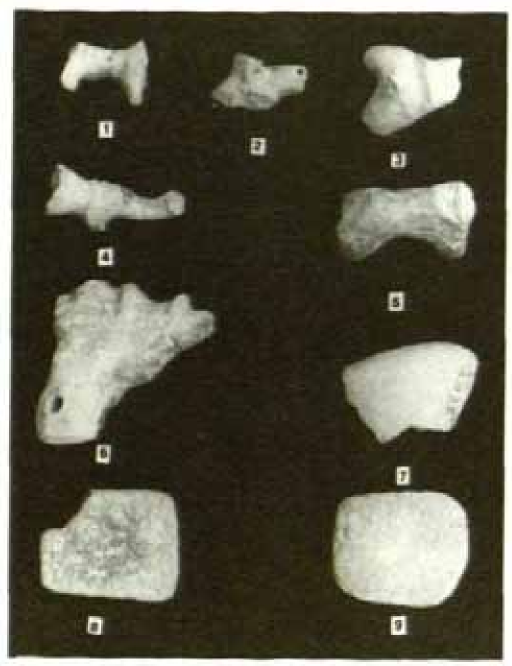
Sankisa : A, *terracotta monkey figurines;* B, *animal figurines. See p. 96*



A



B



C

A, *Sankisa : bone points and arrow-heads;* B-C, *Aunahan : excavated antiquities. See pp.96, 99 and 103*



A



B



C



D

A. *Tehri city : Harihara, seventeenth century;* B. *Mali Deval : early-medieval temple;* C. *Saingaon : Mahishasuramardini, ninth-tenth century* and D. *Baur : Parvati, ninth-tenth century.* *See pp. 111 and 113*



A



B



C



D

Jagajjibanpur : A, *view of the exposed circular structure (north-west corner);* B, *terracotta sealing;* C-D, *terracotta plaques showing Surya and a drummer. See p. 115*



A



B



C

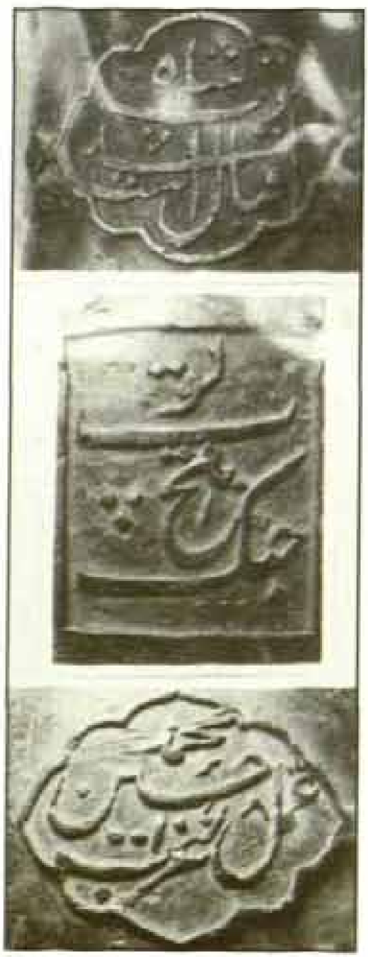


D

Jagajjibanpur : A, B *and* C, *terracotta plaques showing a manuscript on lotus, man with a parasol and a basket-bearer;* D, *decorated bricks. See p. 115*



B





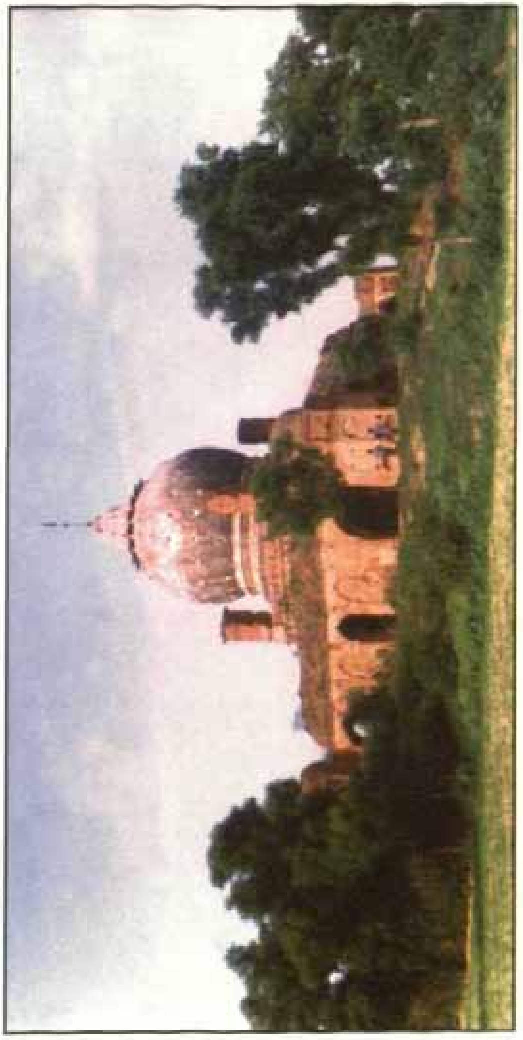
C



A

D

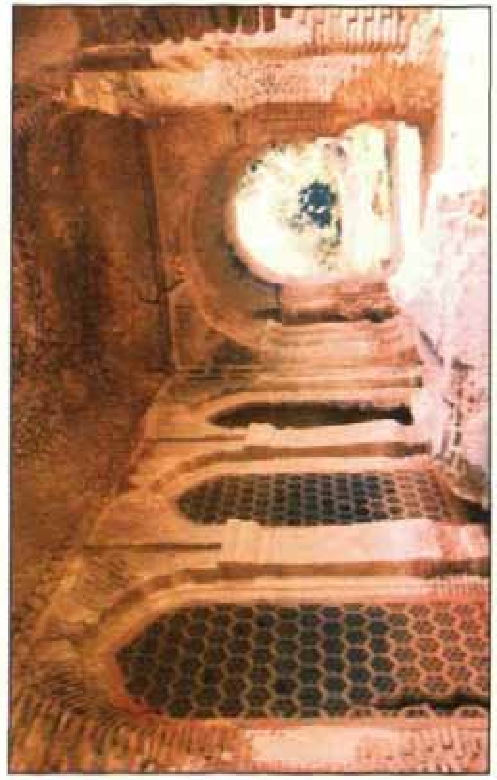
A. *Daulatabad : gun inscription;* B. *Rampur : fragmentary inscription of Lodis;*
C-D. *Kishorepur : gold coins. See pp. 121, 123-124*



A

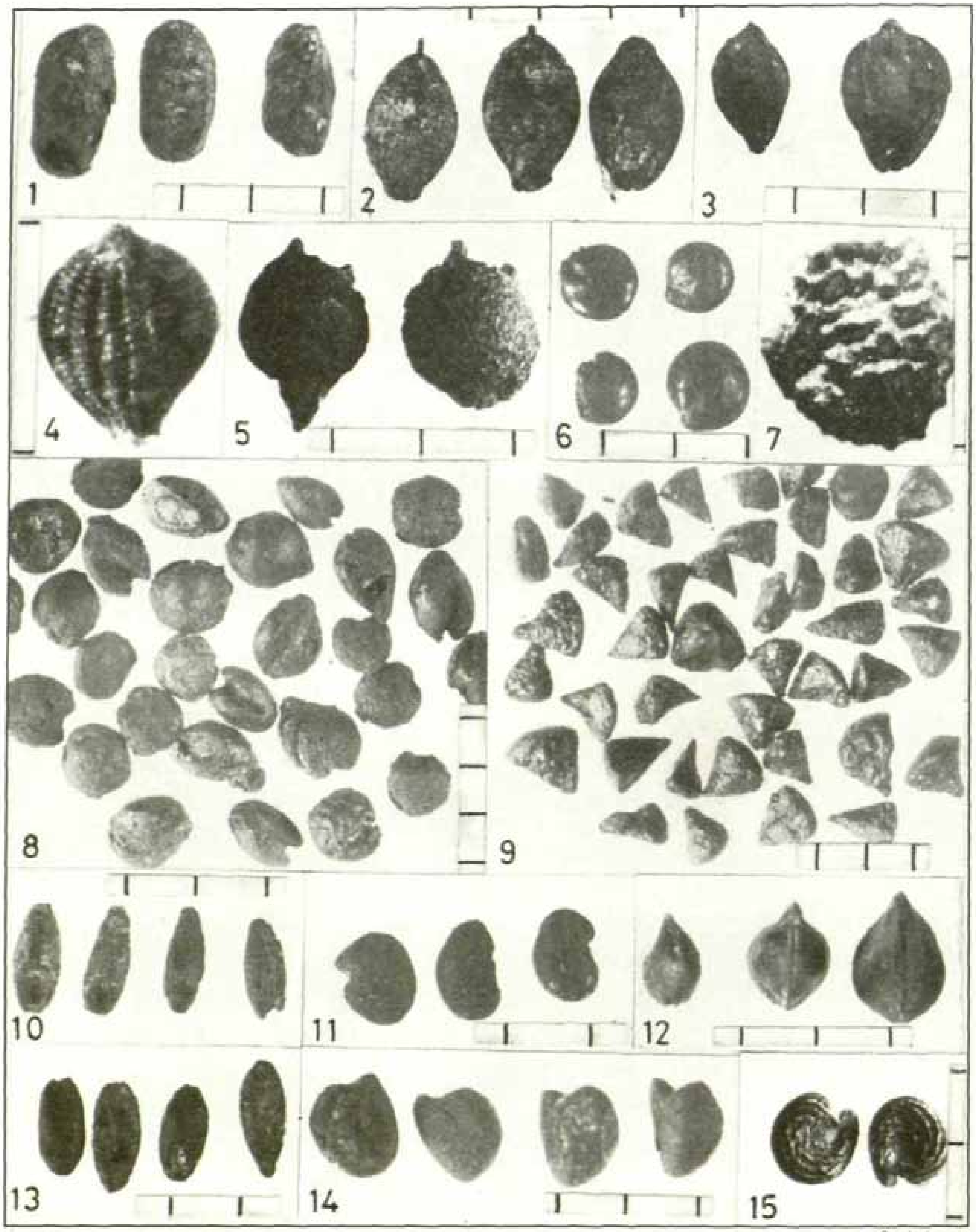


B

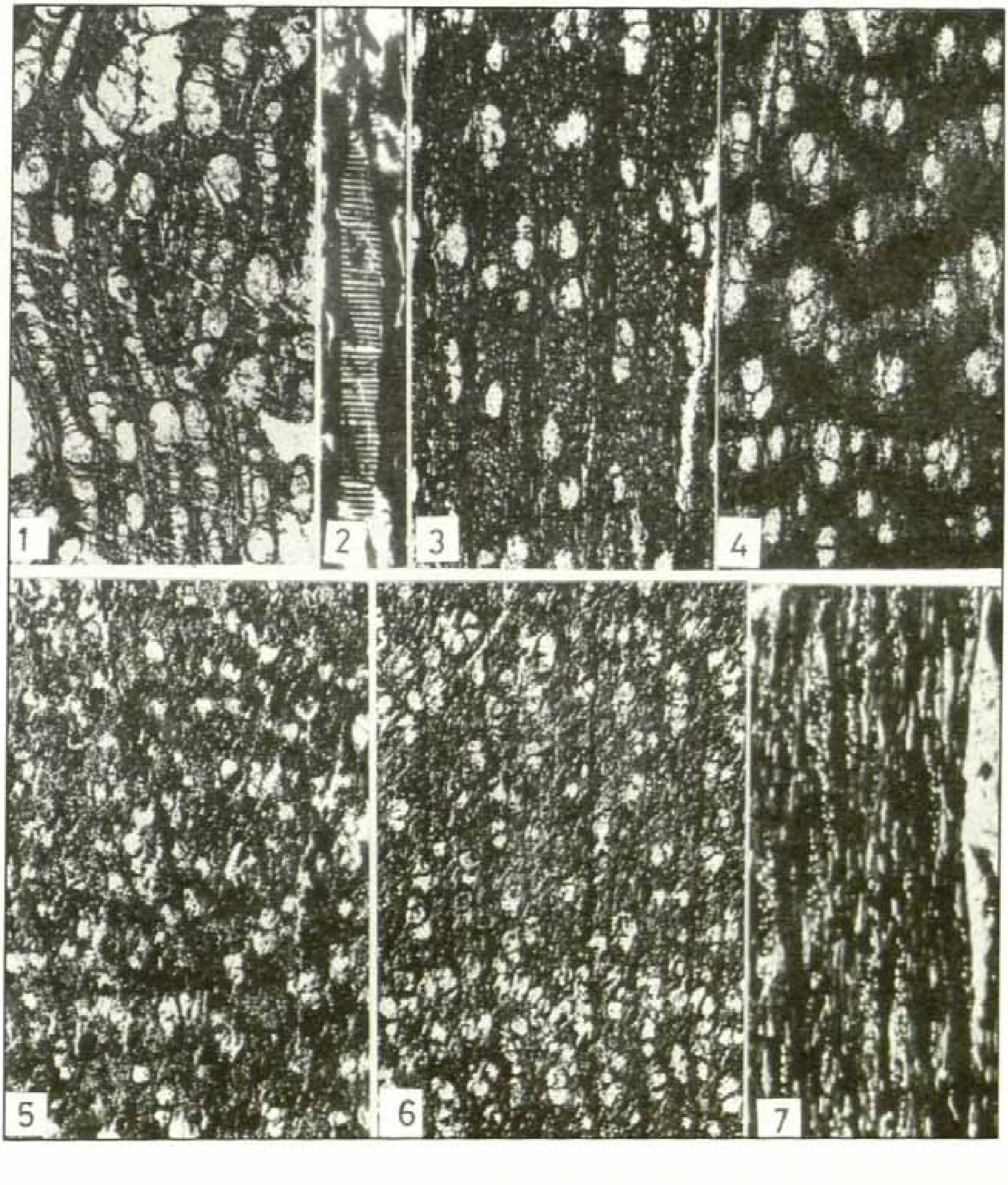


C

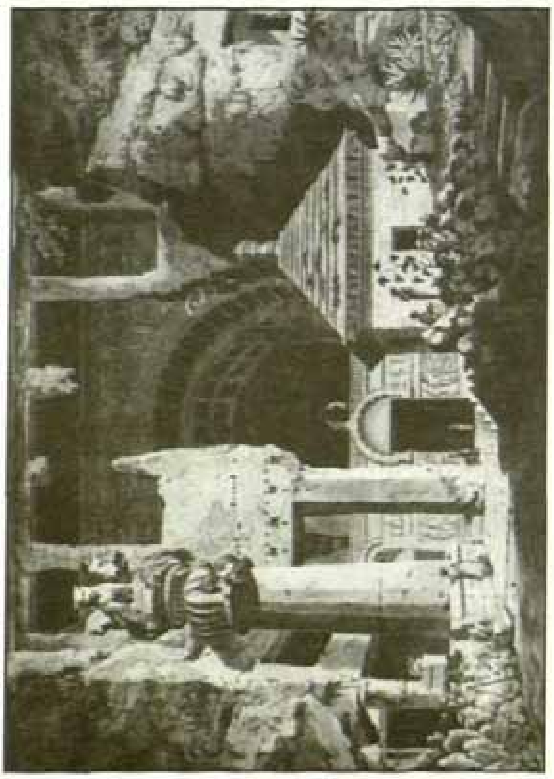
A, Nekpur : tomb of Muhammad Khan Bangash; B-C, *Farrukhabad : general view and jali-work of Bibi Sahiba's (Rabia Begum) tomb.* *See p. 131*



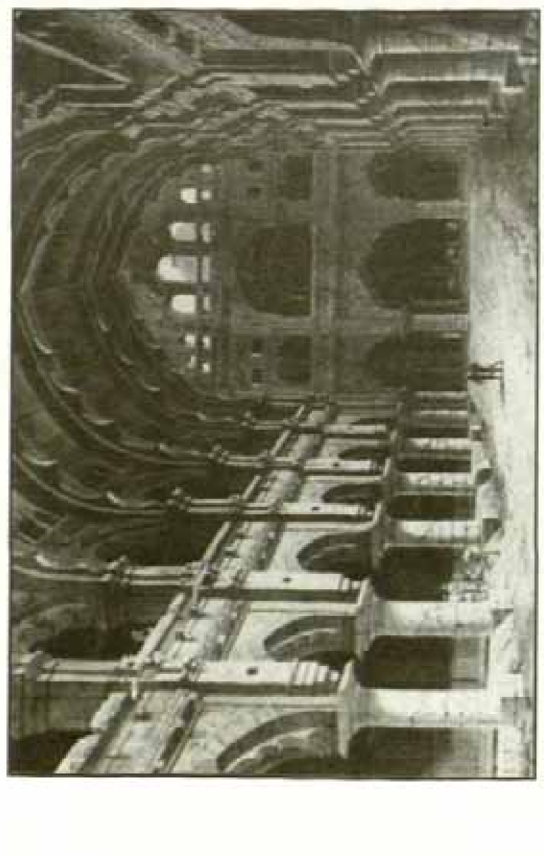
Sanghol : grains and seeds. See pp. 136-137



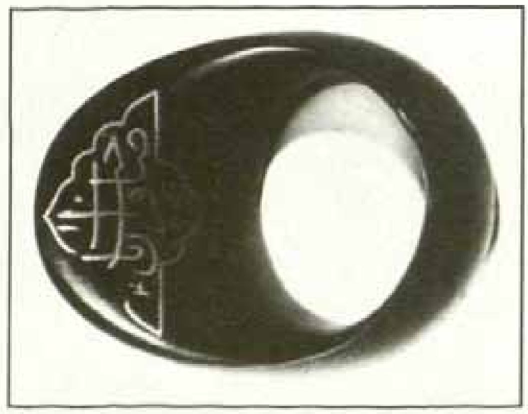
Sanghol : wood charcoals of fruit-trees. See pp. 136-137



A



B



C

Salar Jung Museum : A-B, *engravings of Karle Cave and palace of Tirumala Nayaka;* C, *archery ring of Shahjahan.* *See p. 139*



A

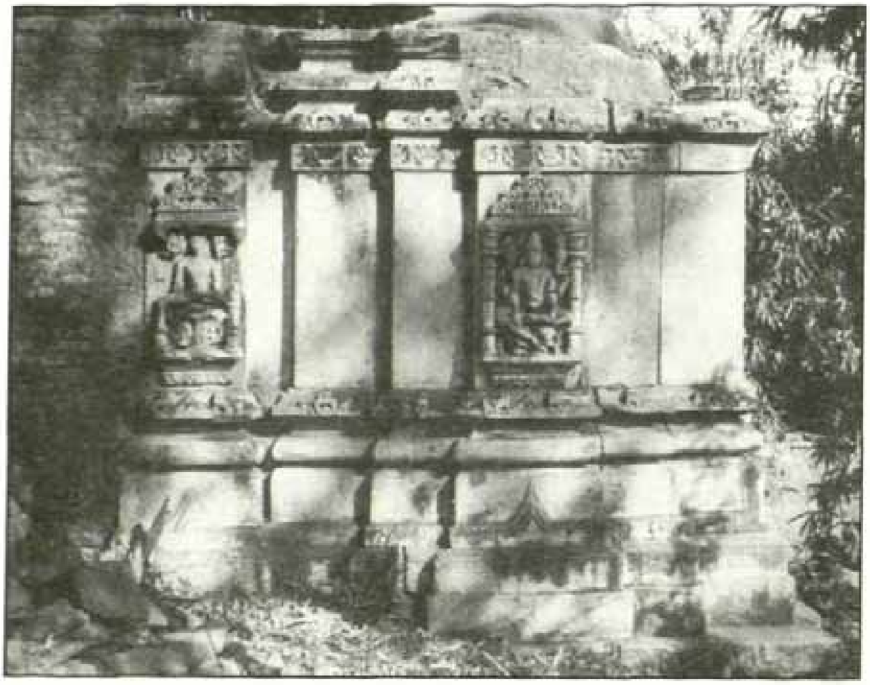


B



C

Mathura Museum : A, *two-armed bronze icon of Rama;* B, *Kubera and Hariti;* C, *inscribed stone-slab.* *See p. 142*



A

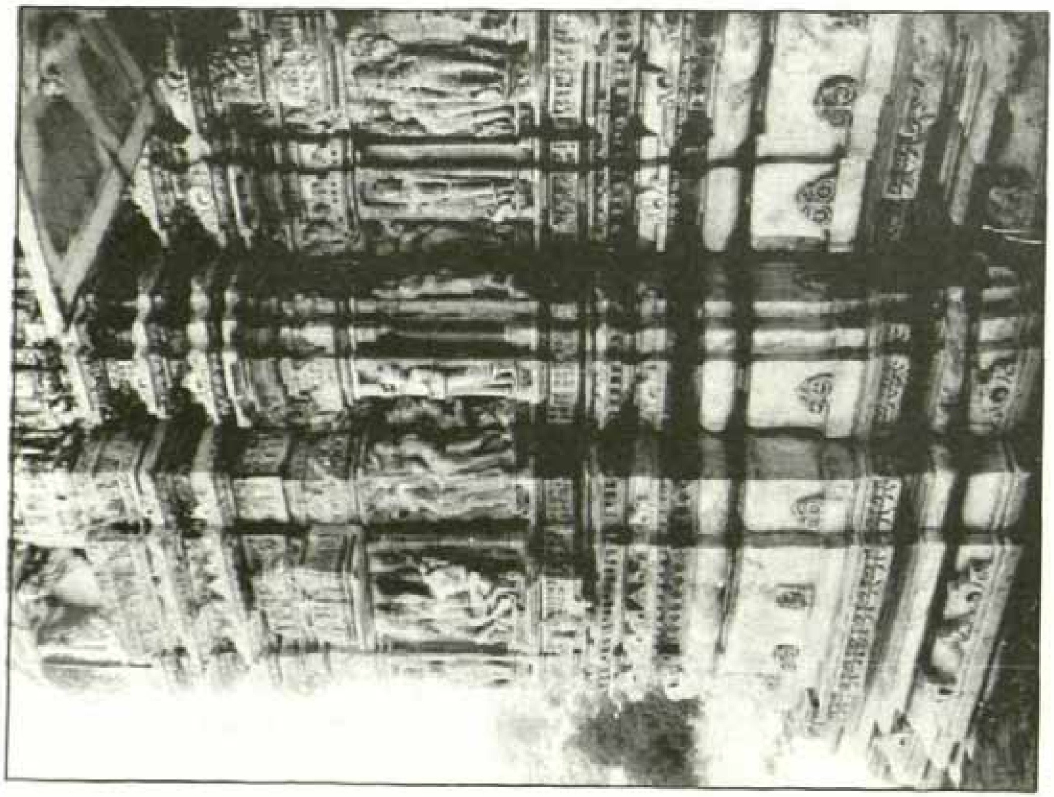


B

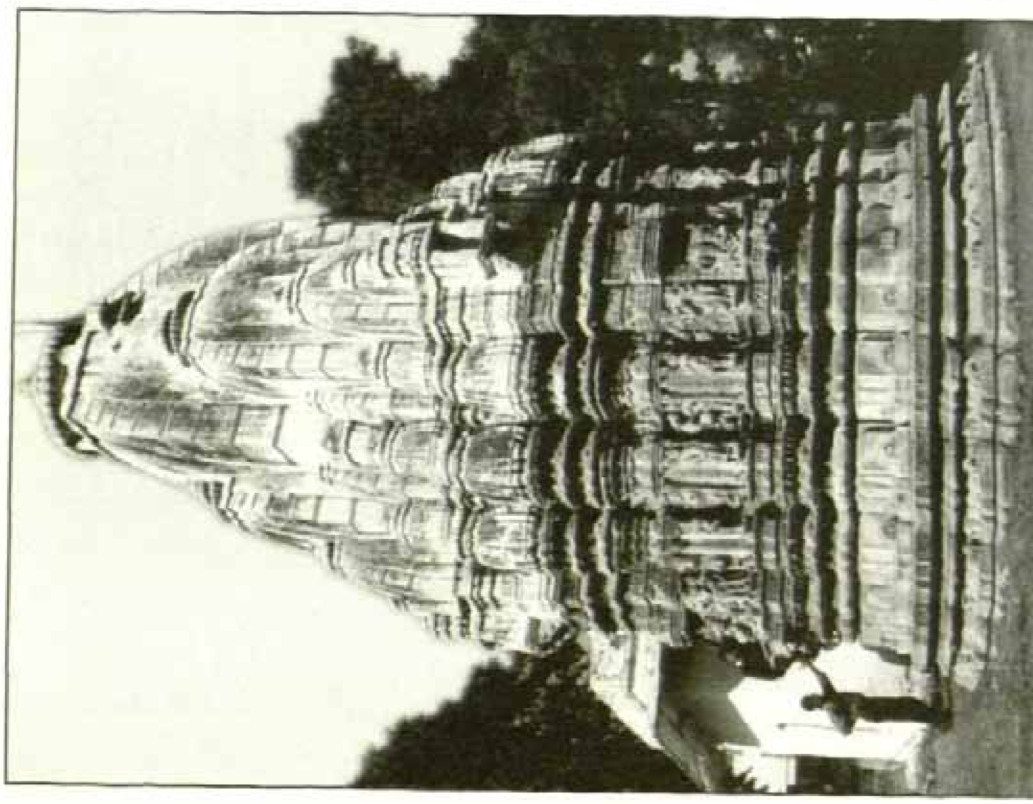
Ahar : A. *Siva Temple, view from south;* B. *four-armed Siva in southern niche of sanctum.* *See p. 145*



Ahar : Durga Temple, view from south. See p. 146



B

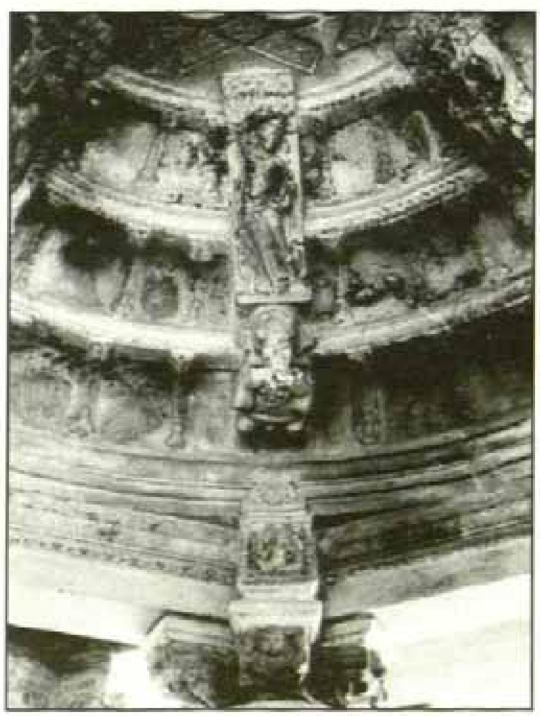


A

Ahar : Mira Temple, A-B, view from south-east and north. See p. 146



A



B

Iswal : A. *Vishnu Temple (mulaprasada), view from south;*
B. *ceiling of sabha-mandapa. See pp. 146-147*

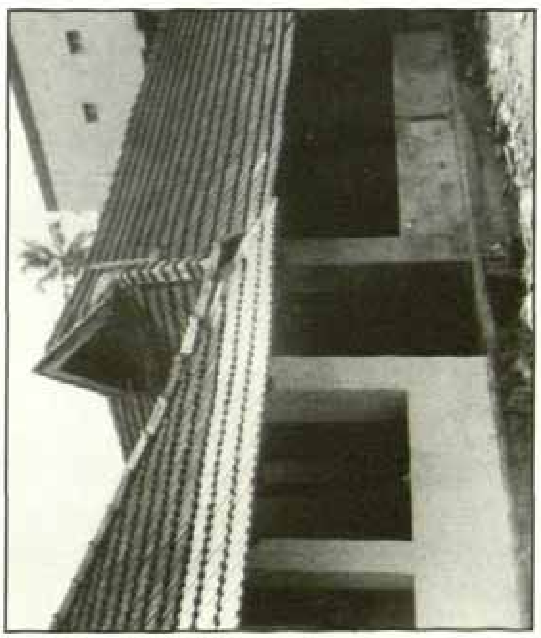


A

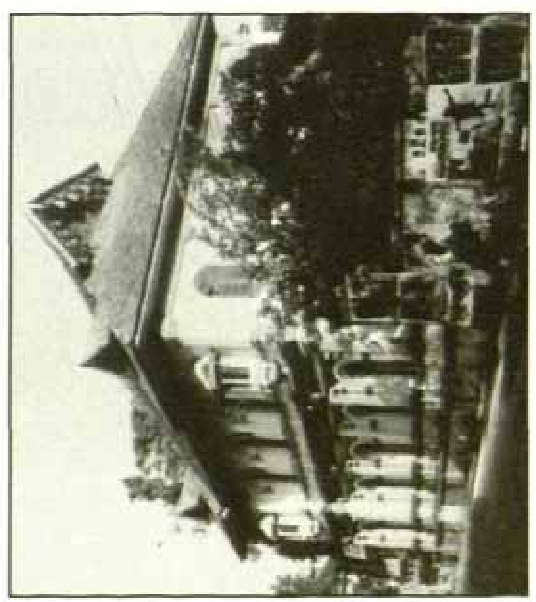


B

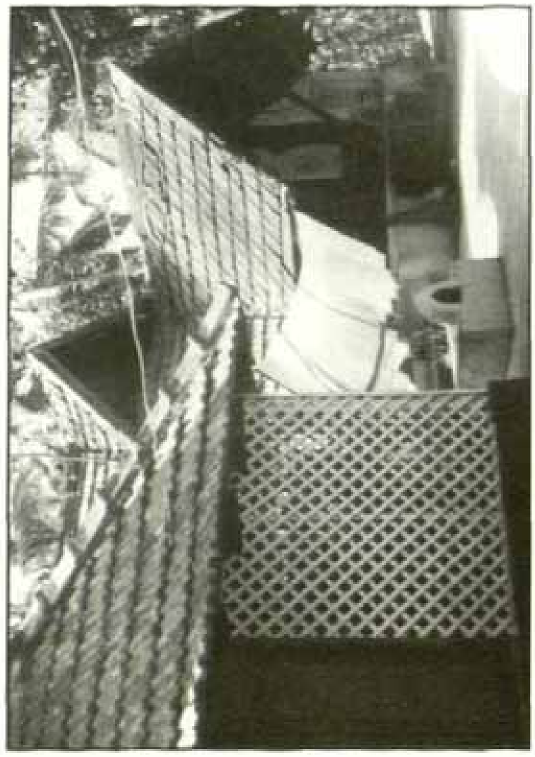
A, *Iswal : Vishnu Temple-complex, northwestern corner shrine;* B, *general view, cluster of old houses around Padmanabhasvamy Temple.* *See p. 147*



A

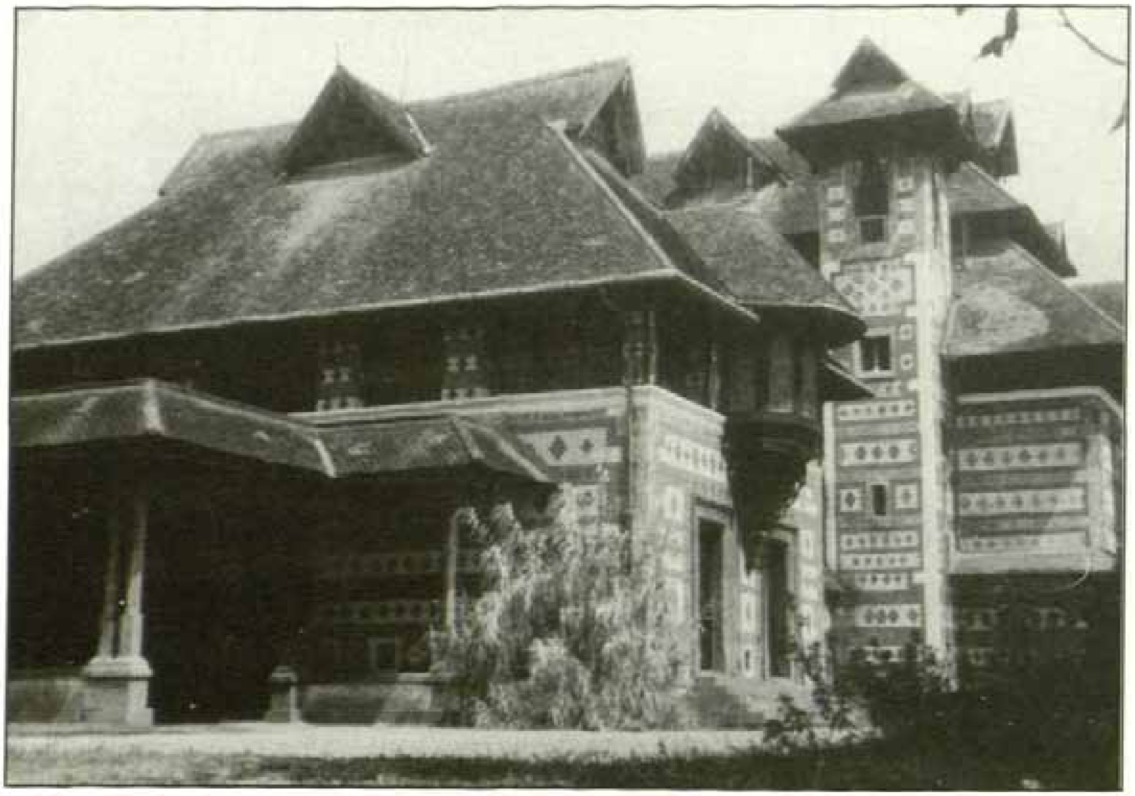


B



C

A-B, general view of Thanjavur Amma Veedu (1 and 2) and C, *general view of Sree Kariyathumadom (Nambudiri's house).* *See p. 149*

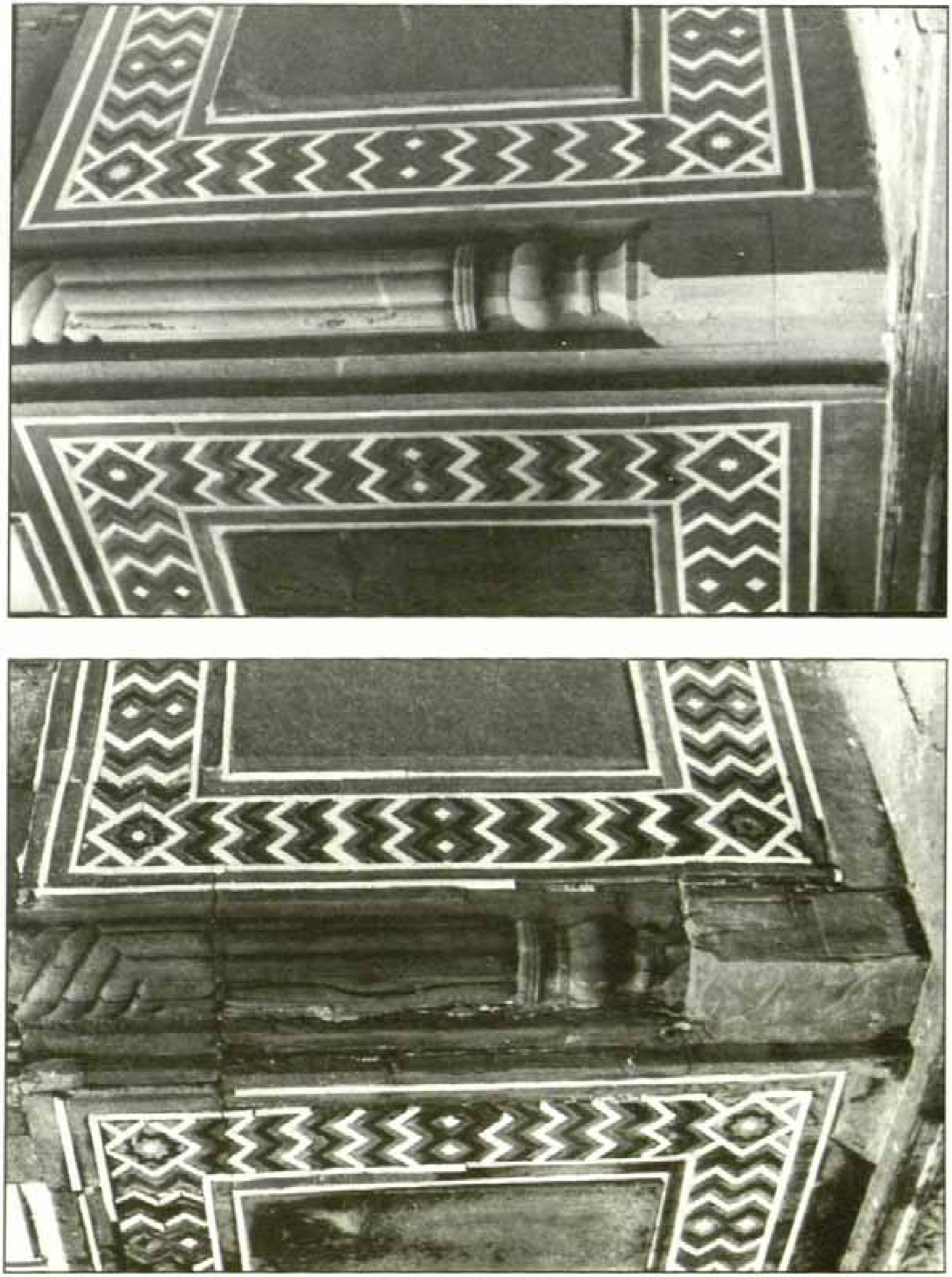


A



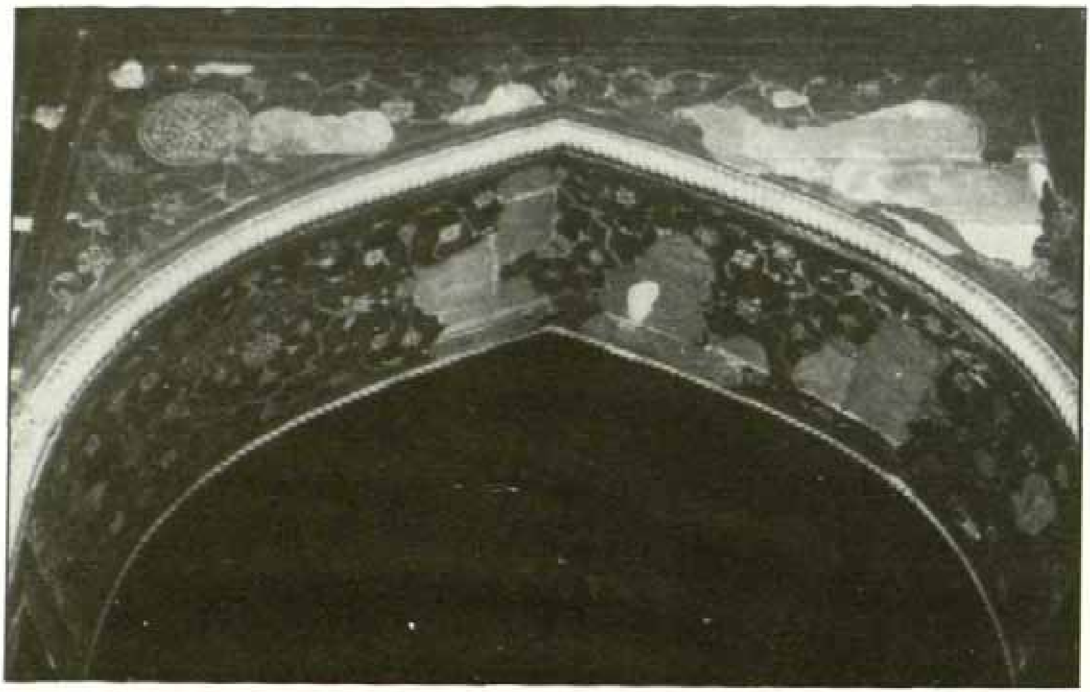
B

A. *Napier Museum : general view;* B. *Kanakakunnu Palace: panoramic view.* *See p. 149*

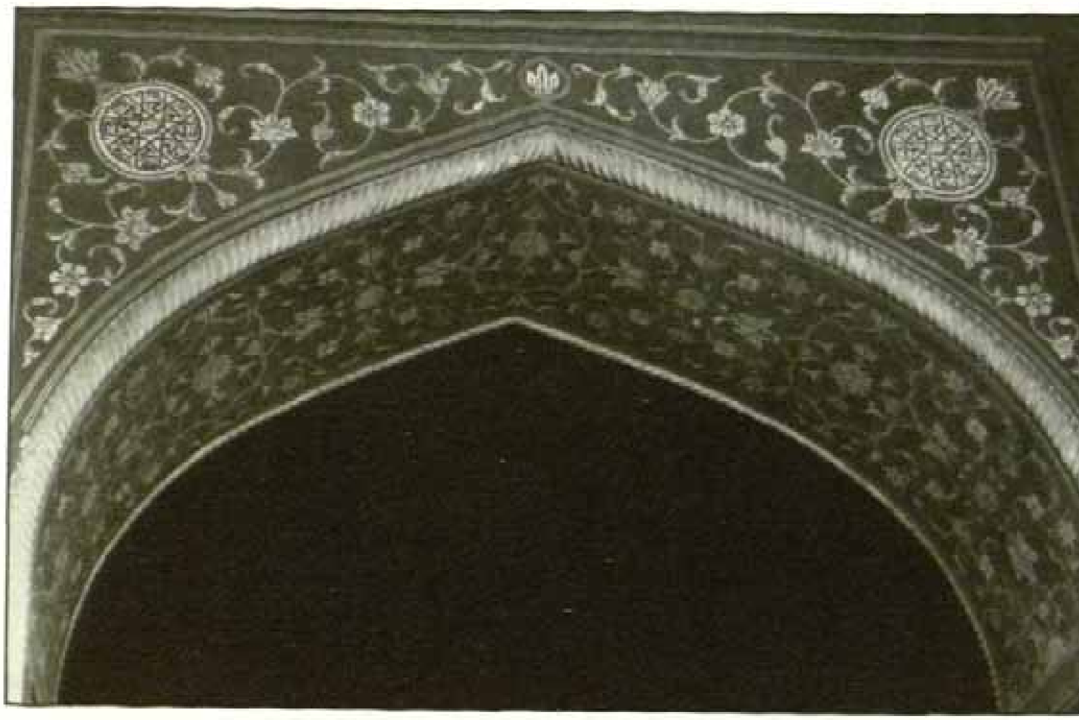


A B

Agra : Taj Mahal, decayed red sandstone pilaster and veneering panels, main gate. A, *before and* B, *after conservation.* *See p. 151*

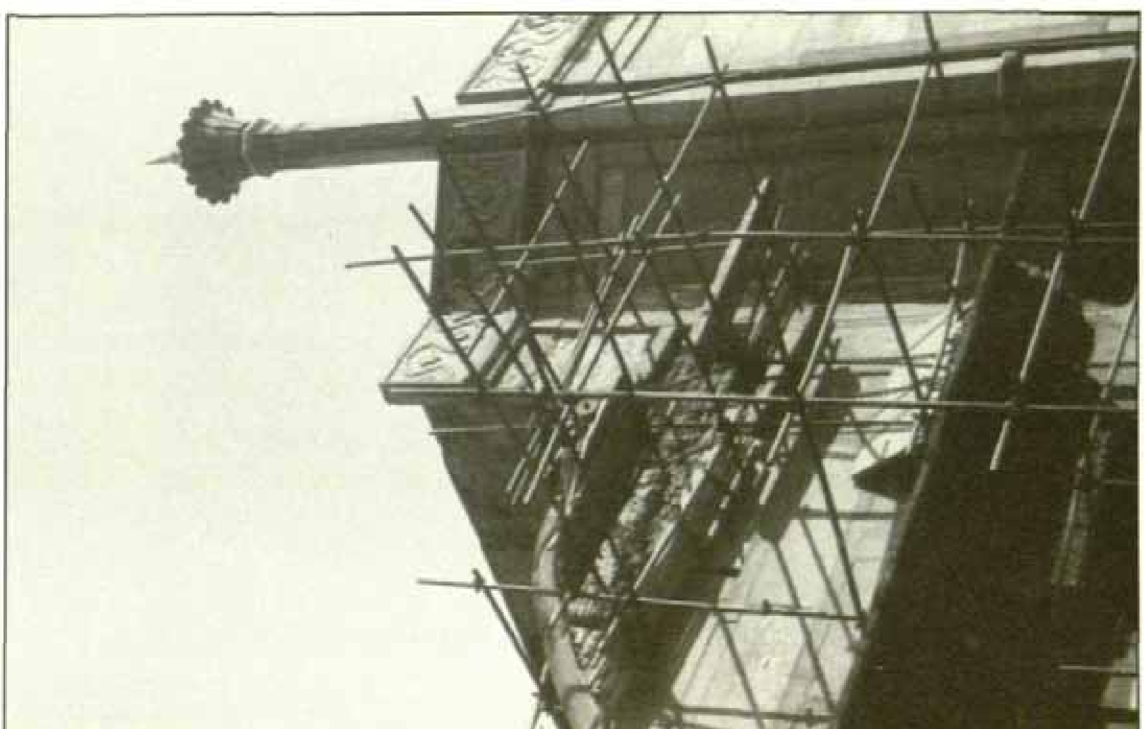


A

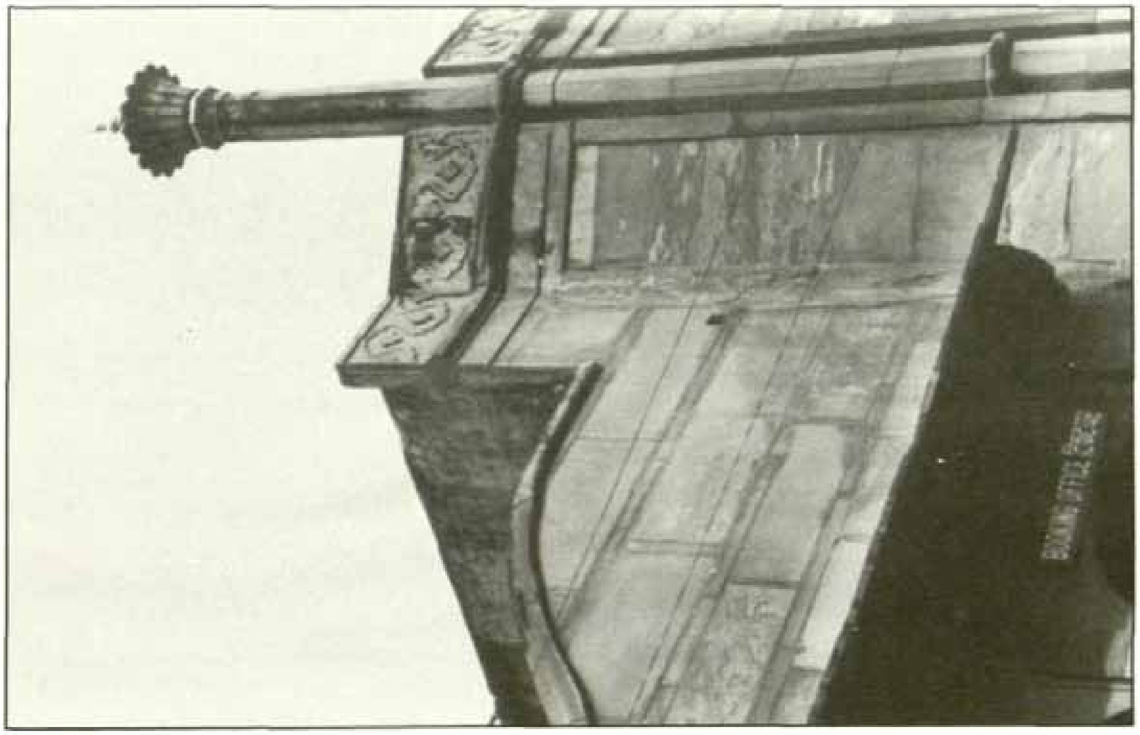


B

Agra : Taj Mahal, decayed and peeled of surface of mosque, A, *before and* B, *after conservation.* *See p. 151*

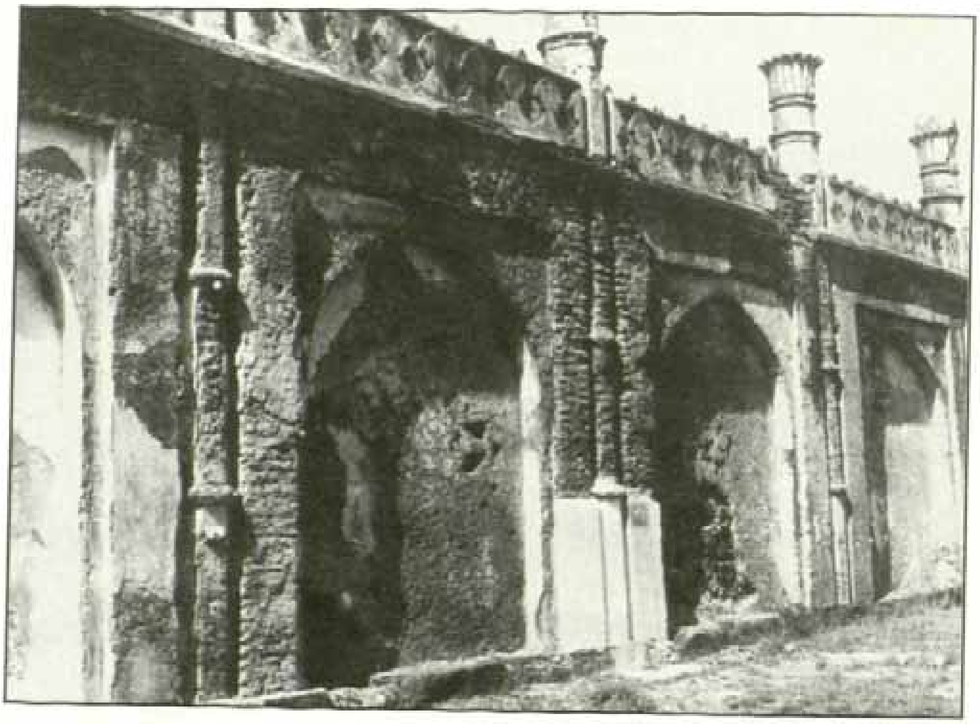


A

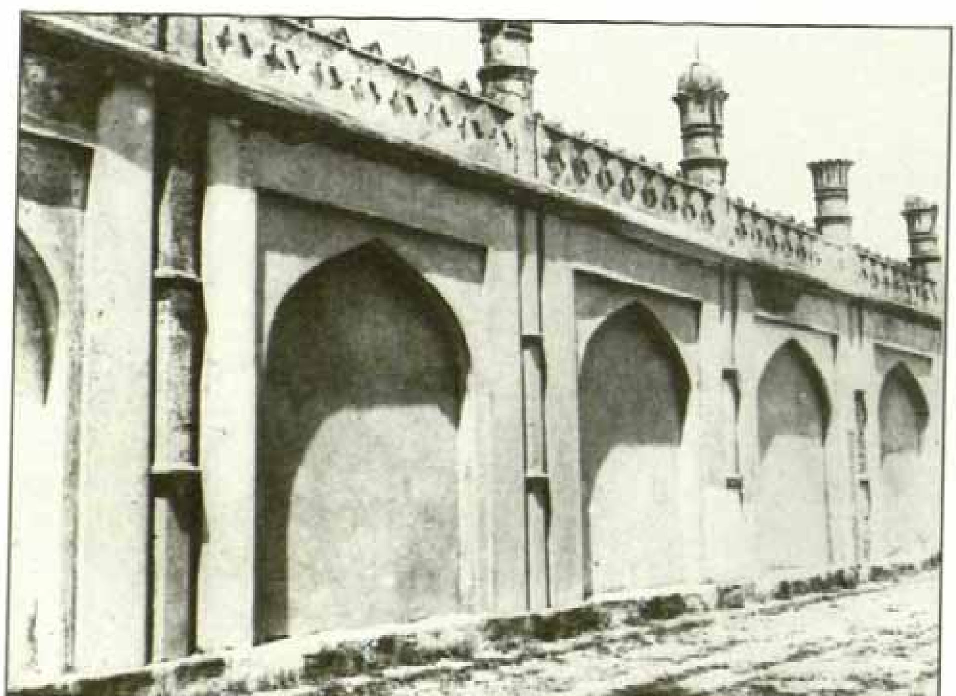


B

Agra : Taj Mahal, bulged lakhauri wall and stone veneering at western gate, A, before and B, after restoration. *See p. 151*

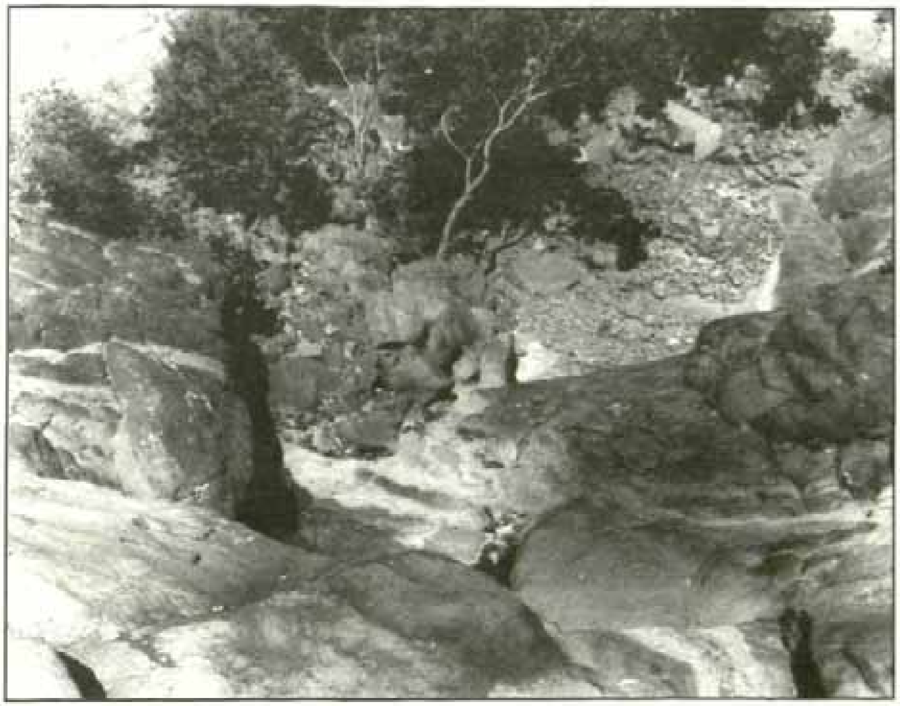


A

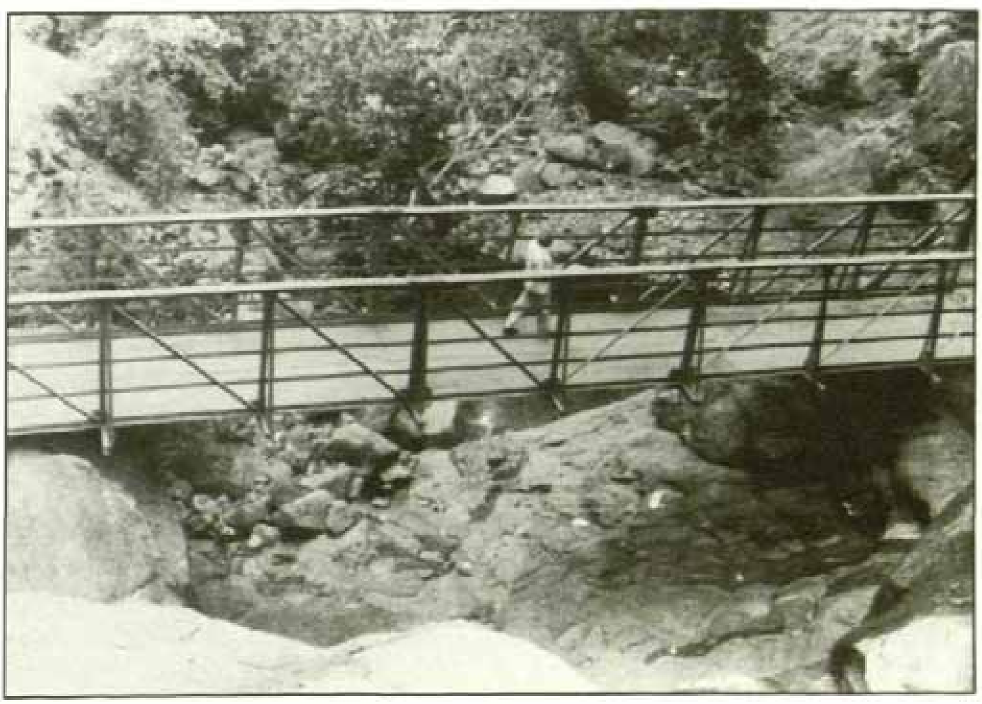


B

Aurangabad : Bibi-ka-Maqbara, western compound-wall, A, *before and* B, *after restoration.* *See p. 153*

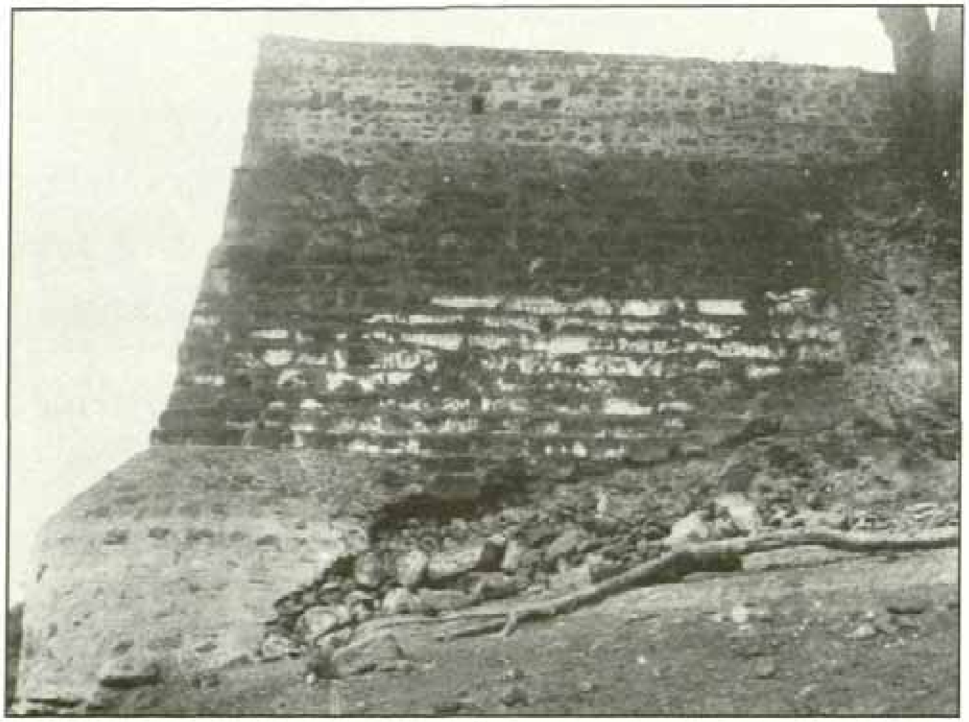


A



B

Pitalkhora : Cave I, A, *before and* B, *after providing the foot bridge across the nala.* *See p. 154*

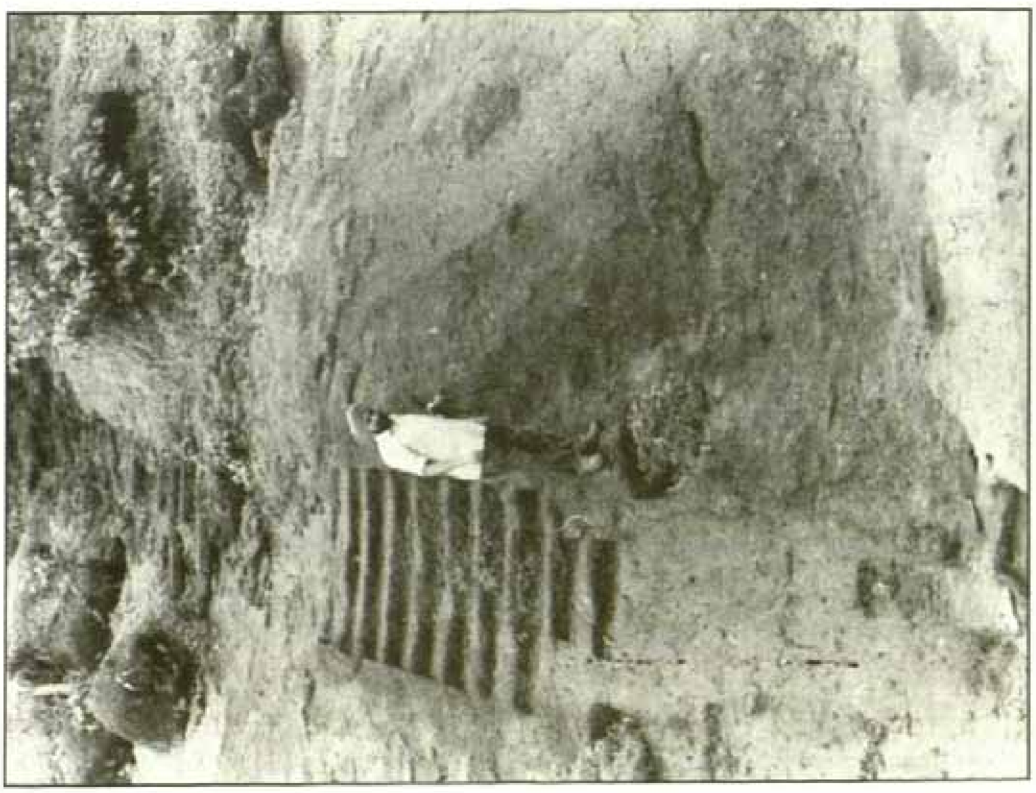


A

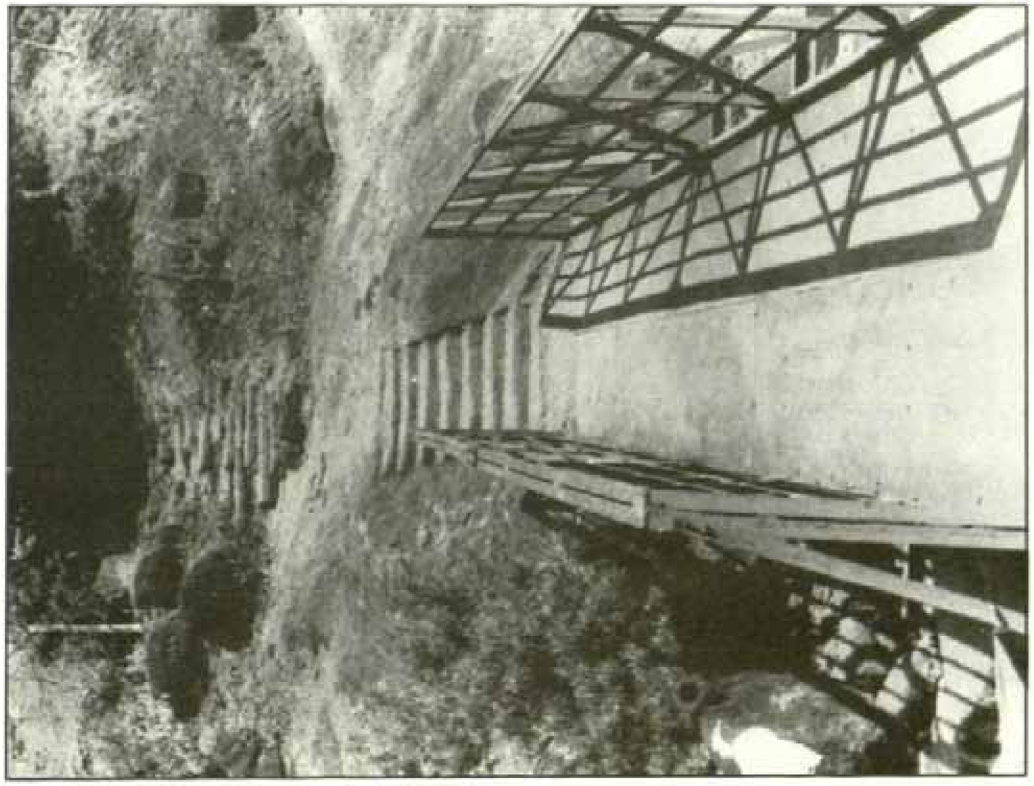


B

Changdeo Temple : prakara-wall, A, *before and* B, *after reconstruction. See p. 154*

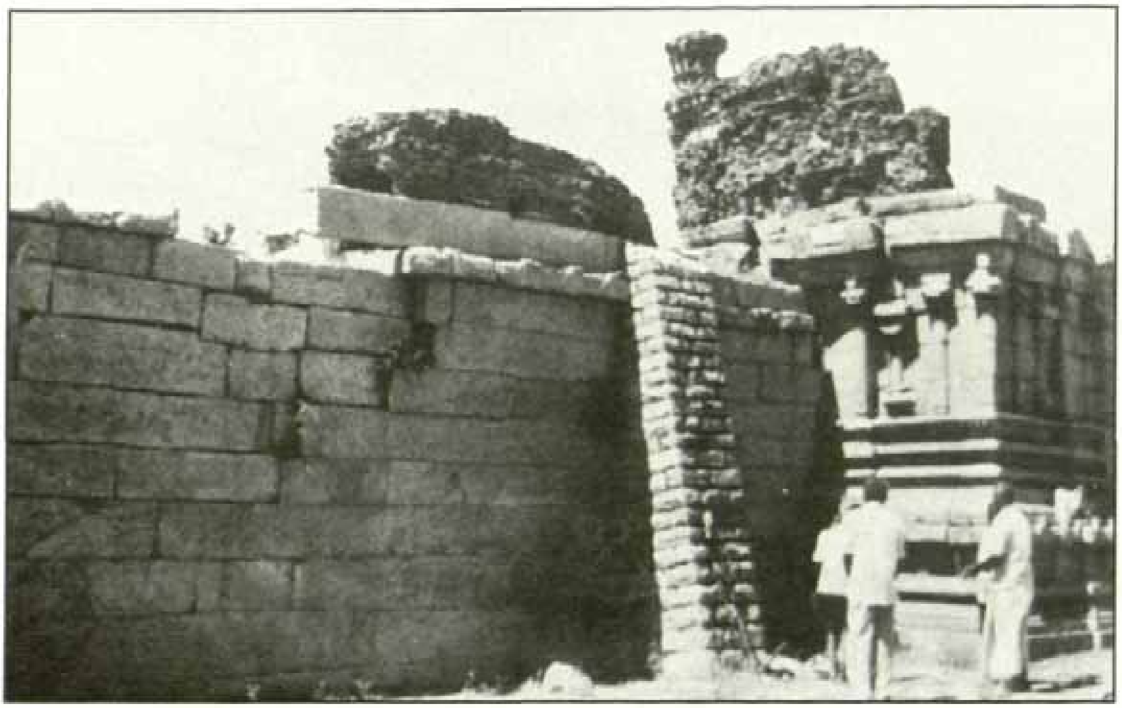


A



B

Kanheri : Buddhist Cave (No. 7). A, before and B, after providing foot bridge. *See p. 155*

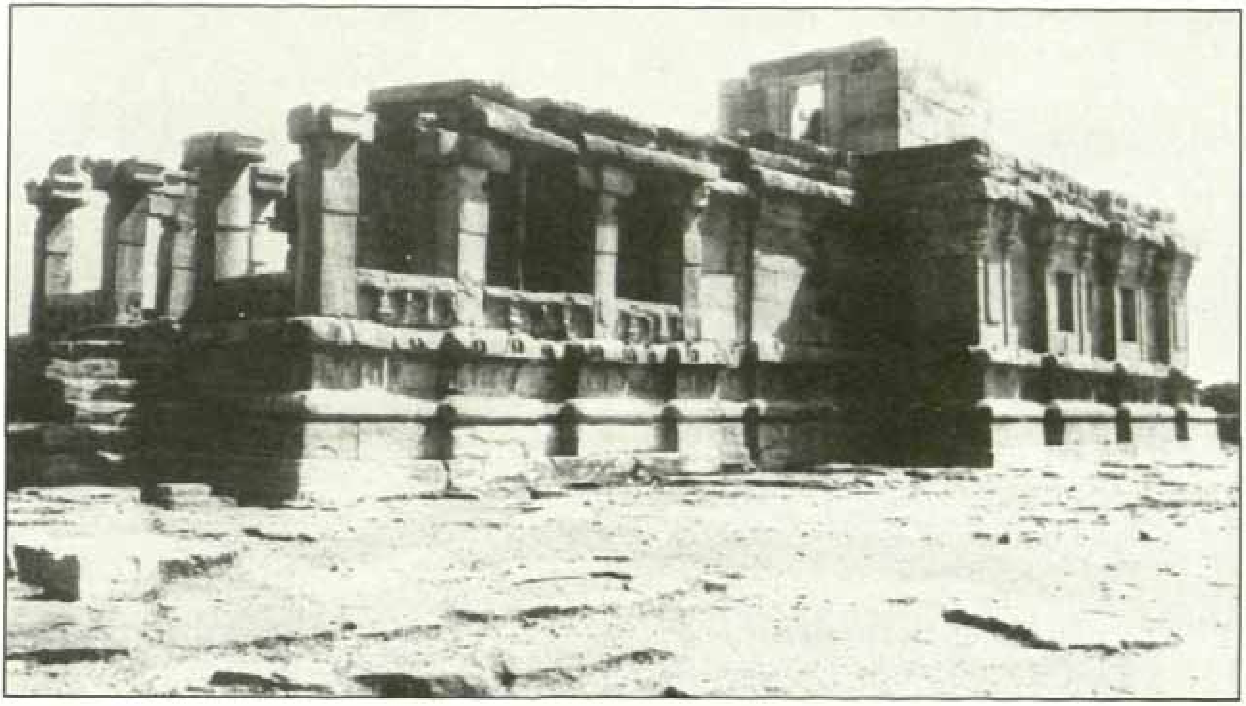


A



B

Venkatapuram : Achyutaraya Temple, A, *before and* B, *after conservation of enclosure-wall.* *See p. 156*

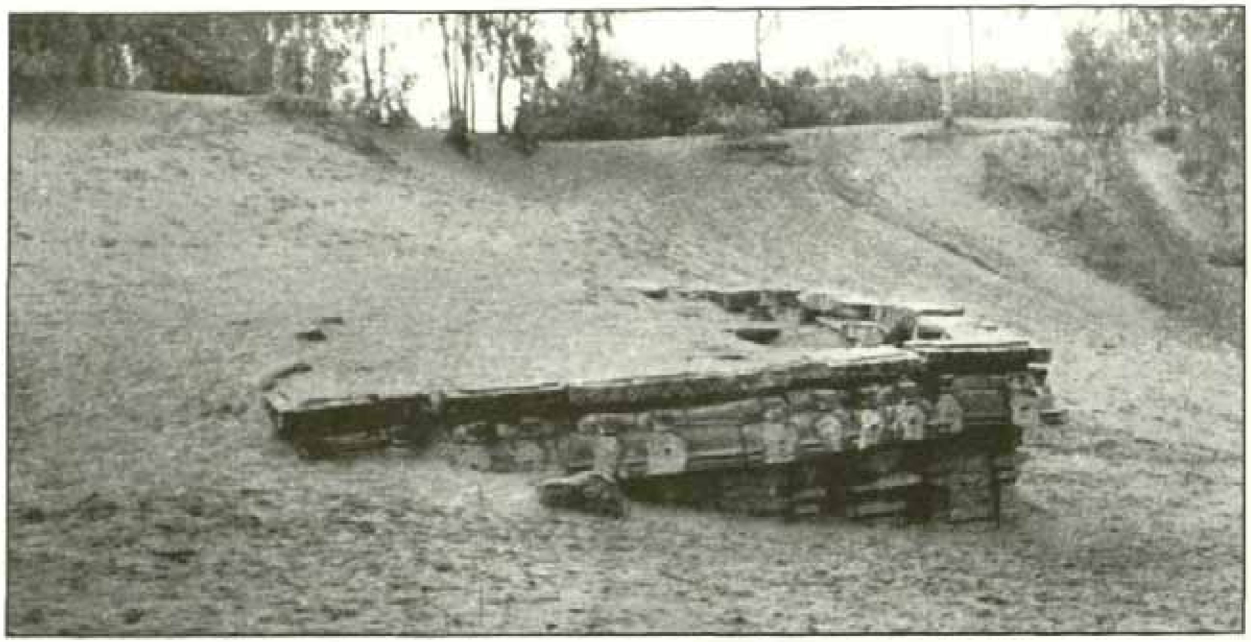


A

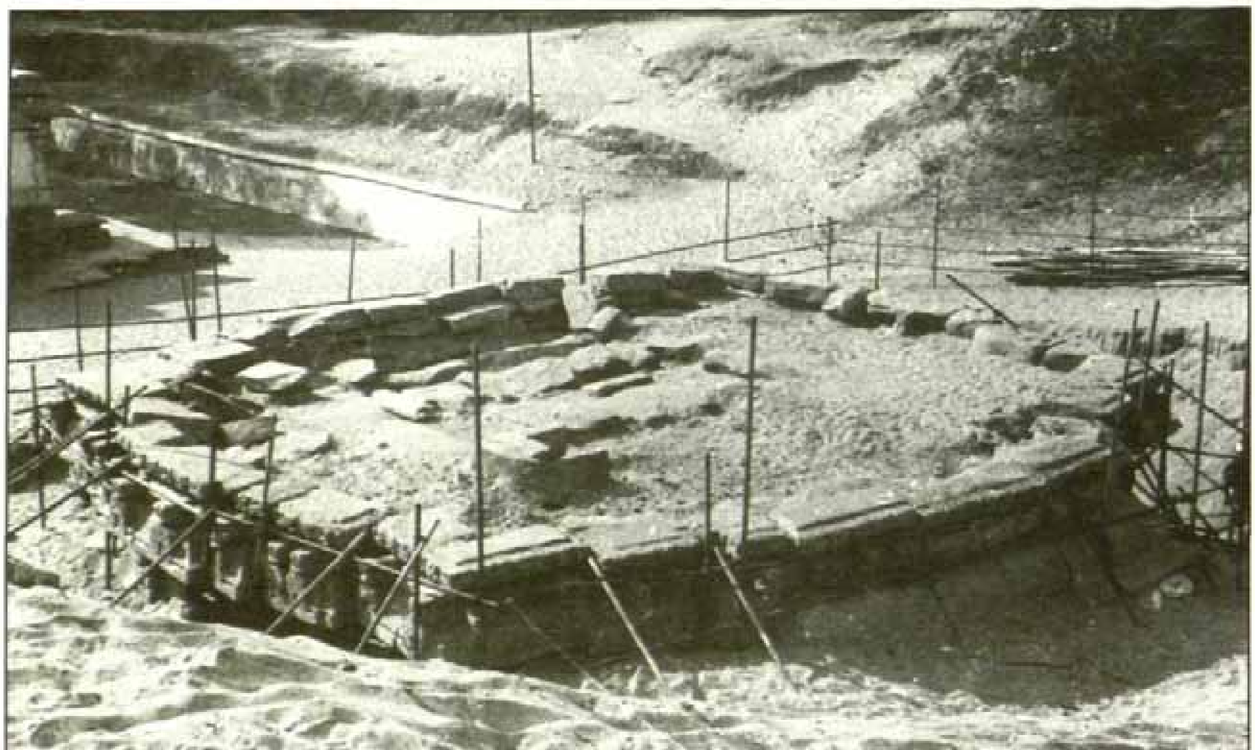


B

Aihole : Meguti Temple. A, before and B, after conservation of mukha-mandapa. *See p. 156*



A

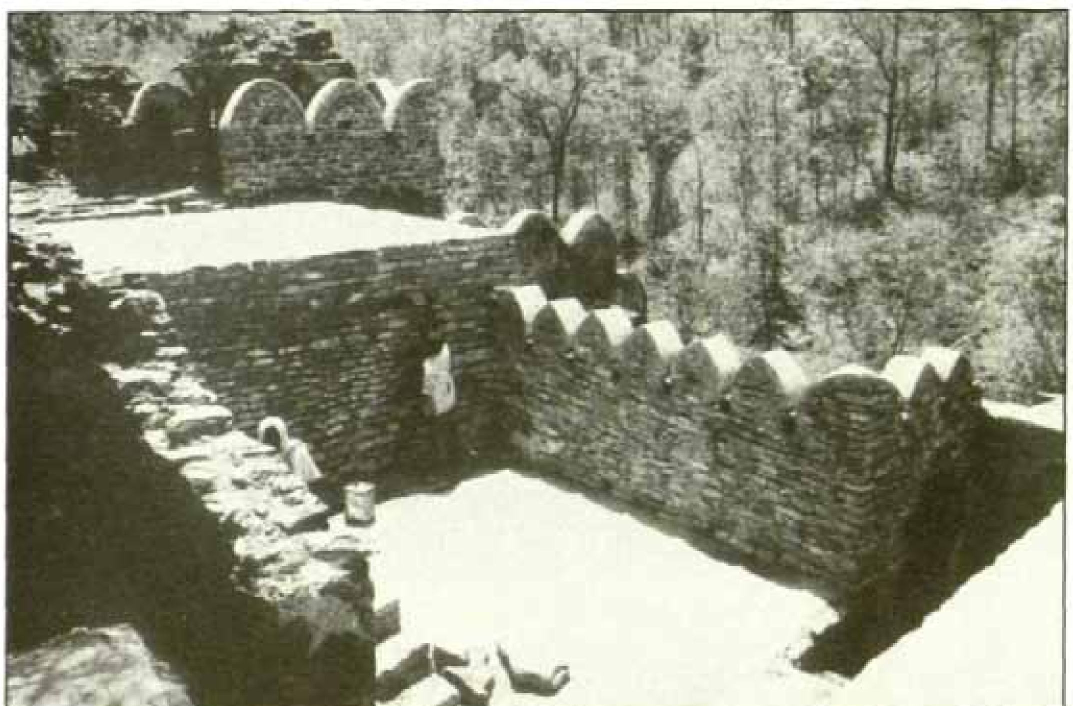


B

Talkad : Kirti Narayana Temple, mahadvara, A, *before* and B, *after clearance. See p. 157*



A

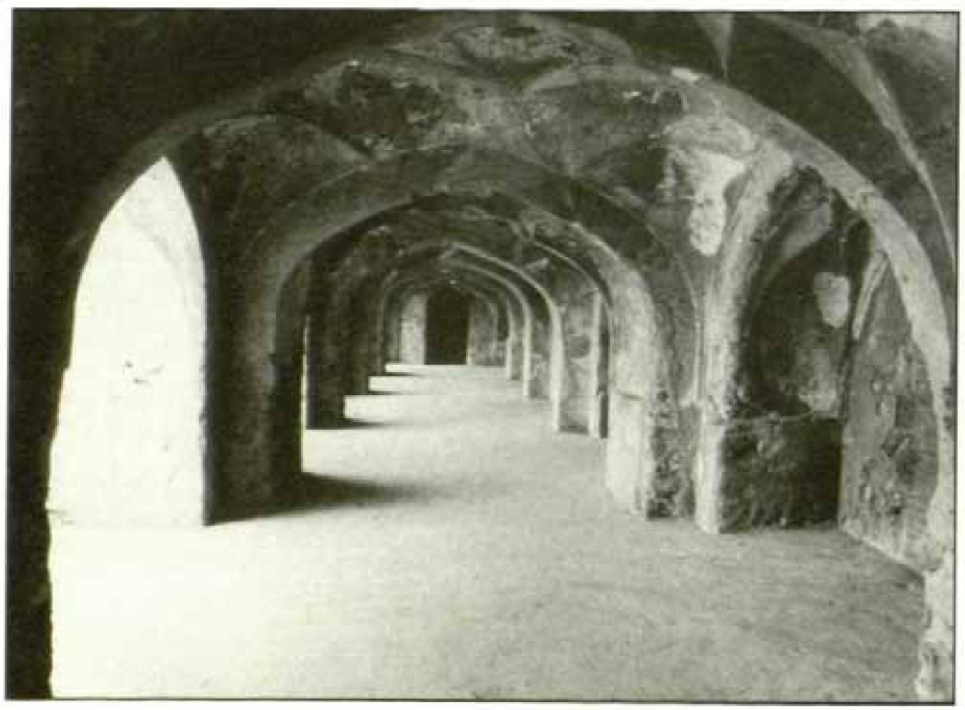


B

Singorgarh Fort : guardrooms. A, before and B, during conservation. See p. 158

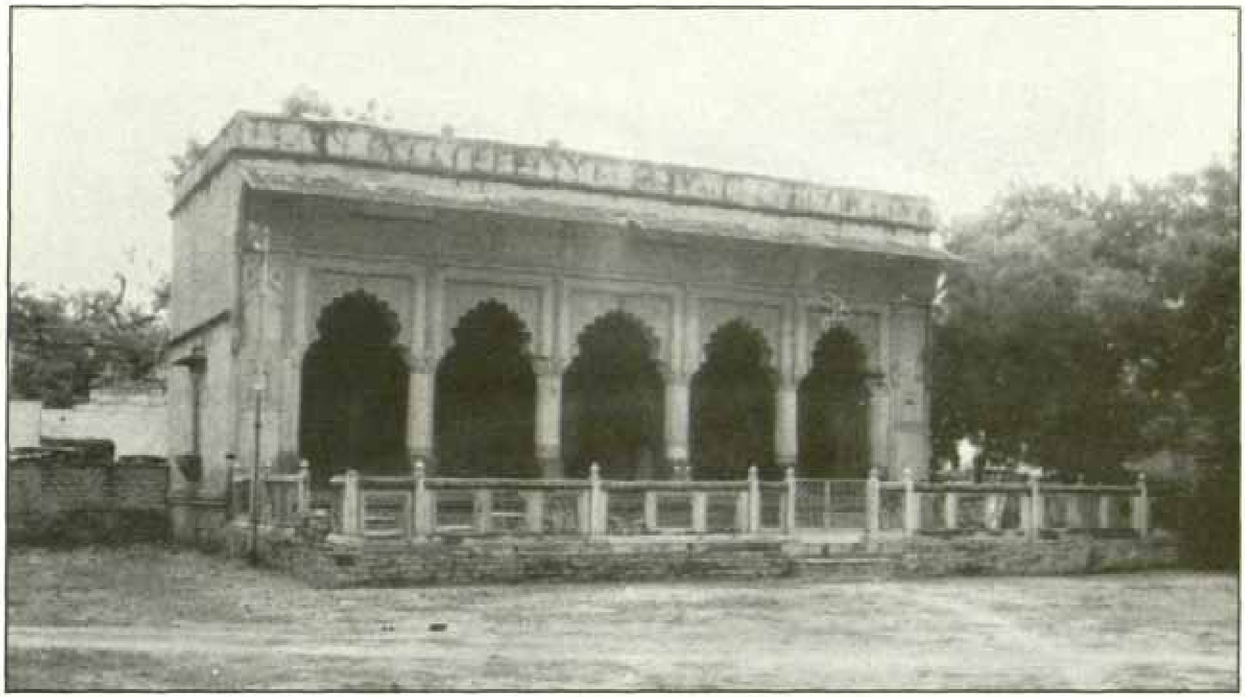


A



B

Burhanpur : Palace-complex. A, *before and* B, *after conservation of Shahi Killa.* *See p. 160*



A

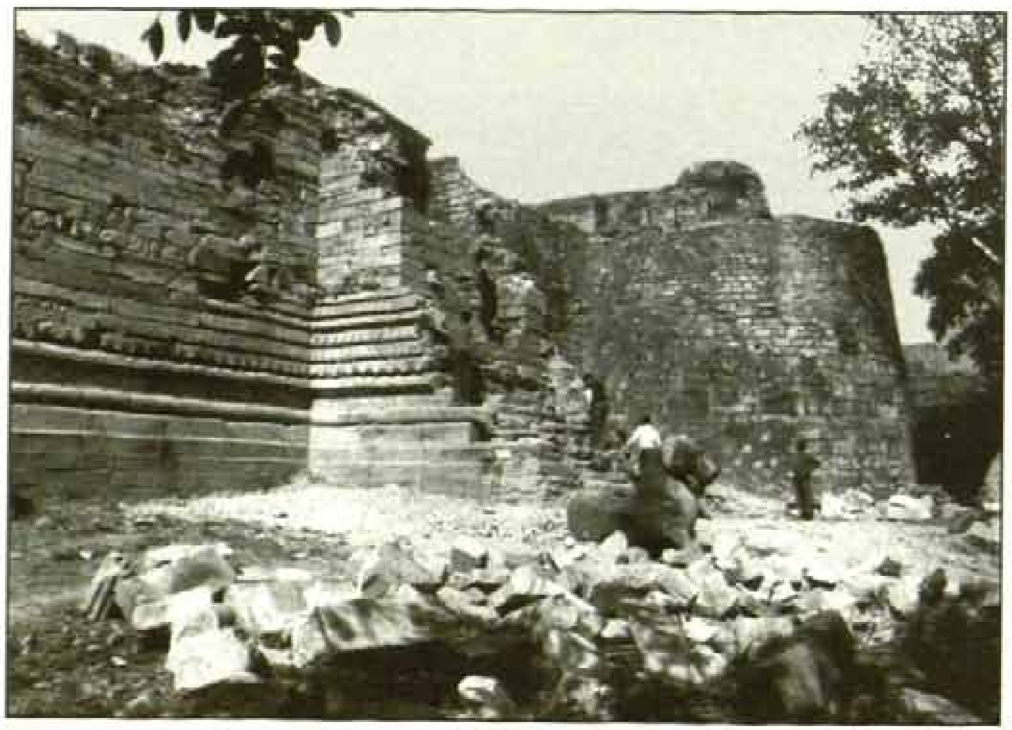


B

Mohammad Ghaus Tomb-complex ; Jama Masjid, stone-jali. A, *before and* B, *after conservation. See p. 161*



A

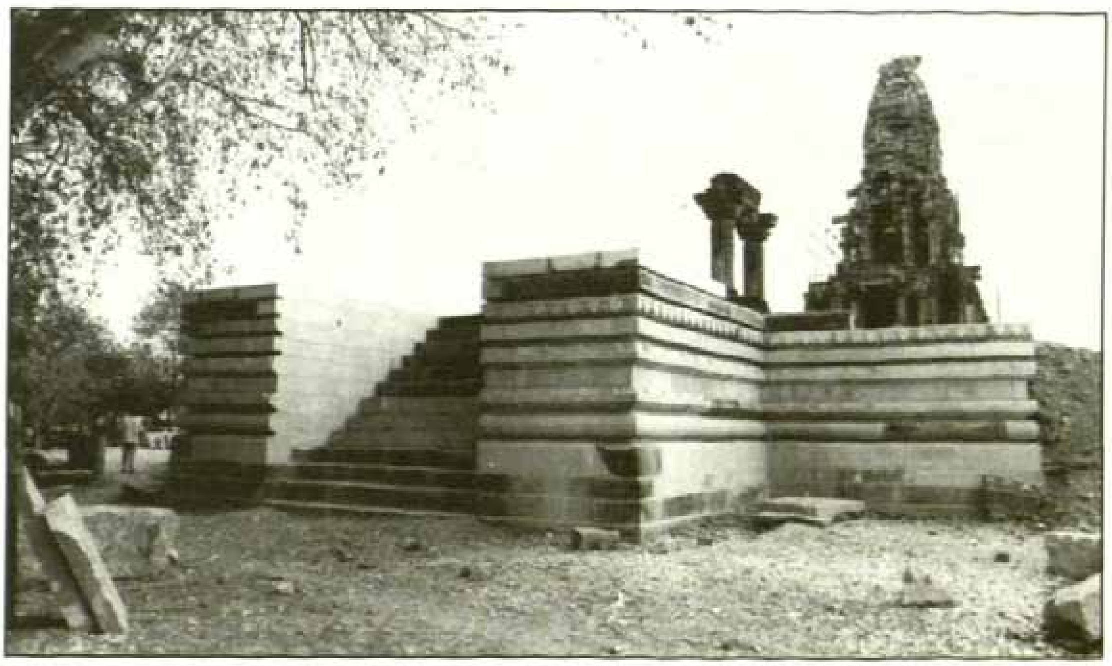


B

Padawali Fort : entrance gate, A, *before and* B, *during restoration.* *See p. 162*



A

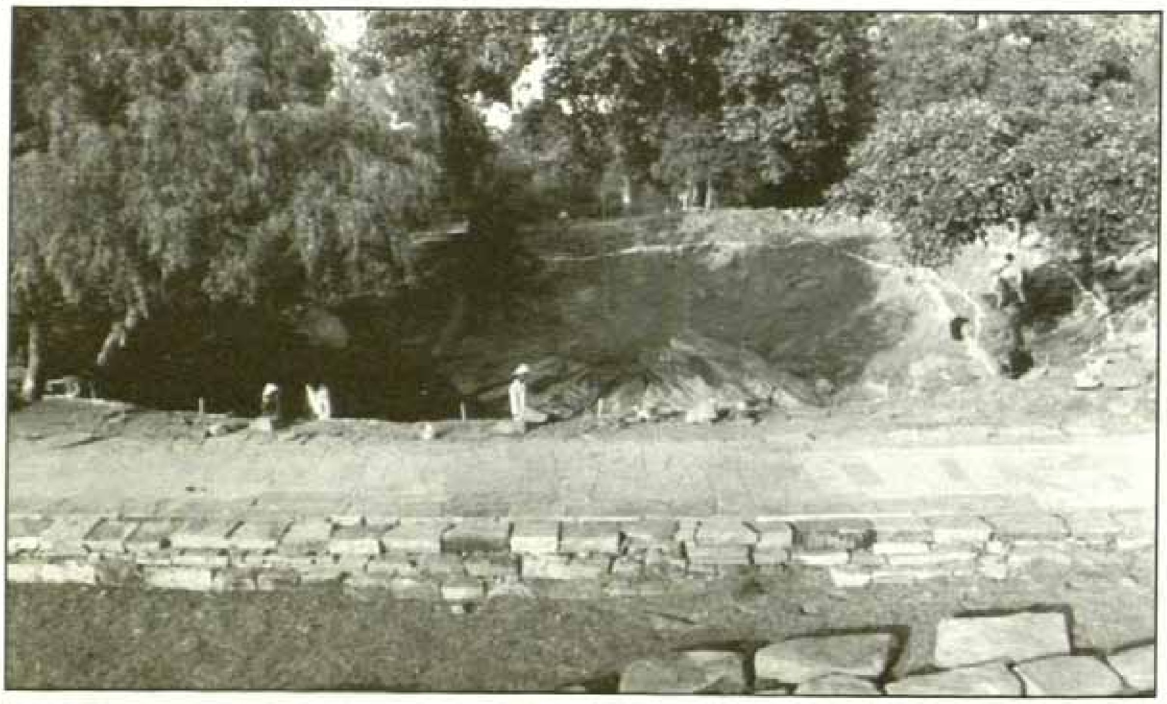


B

Suhania : Kakanmath Temple, A. *before and* B. *after conservation. See p. 162*



A



B

Sanchi : Stupa 2. A. *before and* B. *during revival of Tank (2). See p. 162*

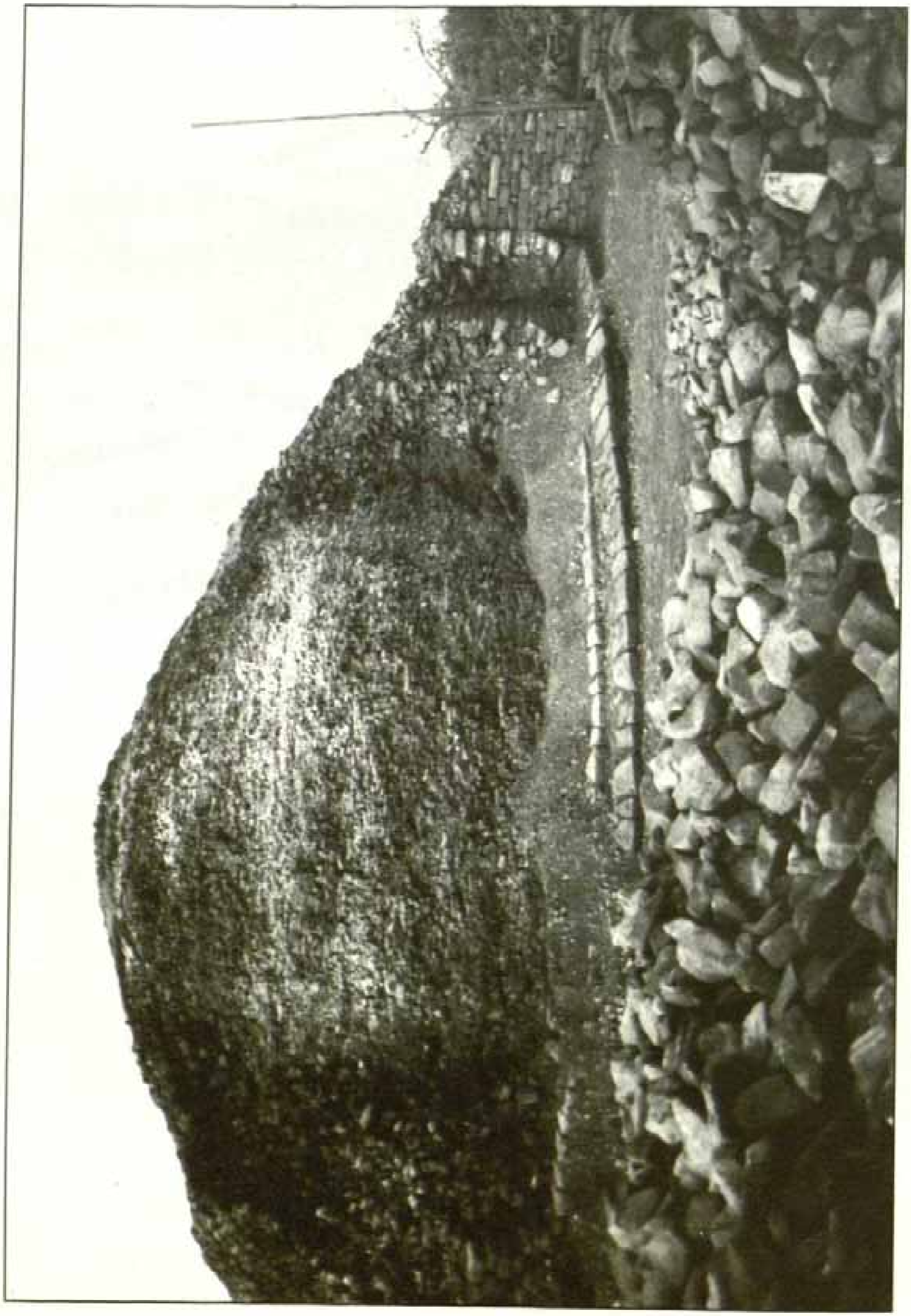


A

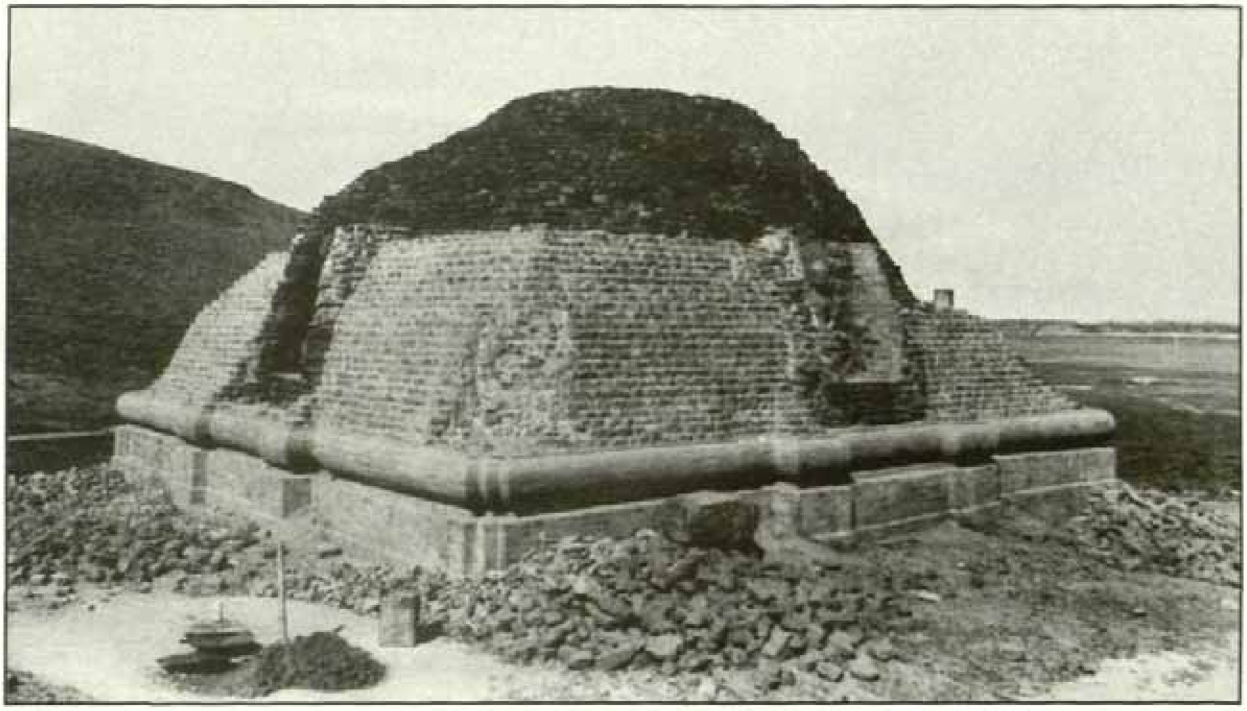


B

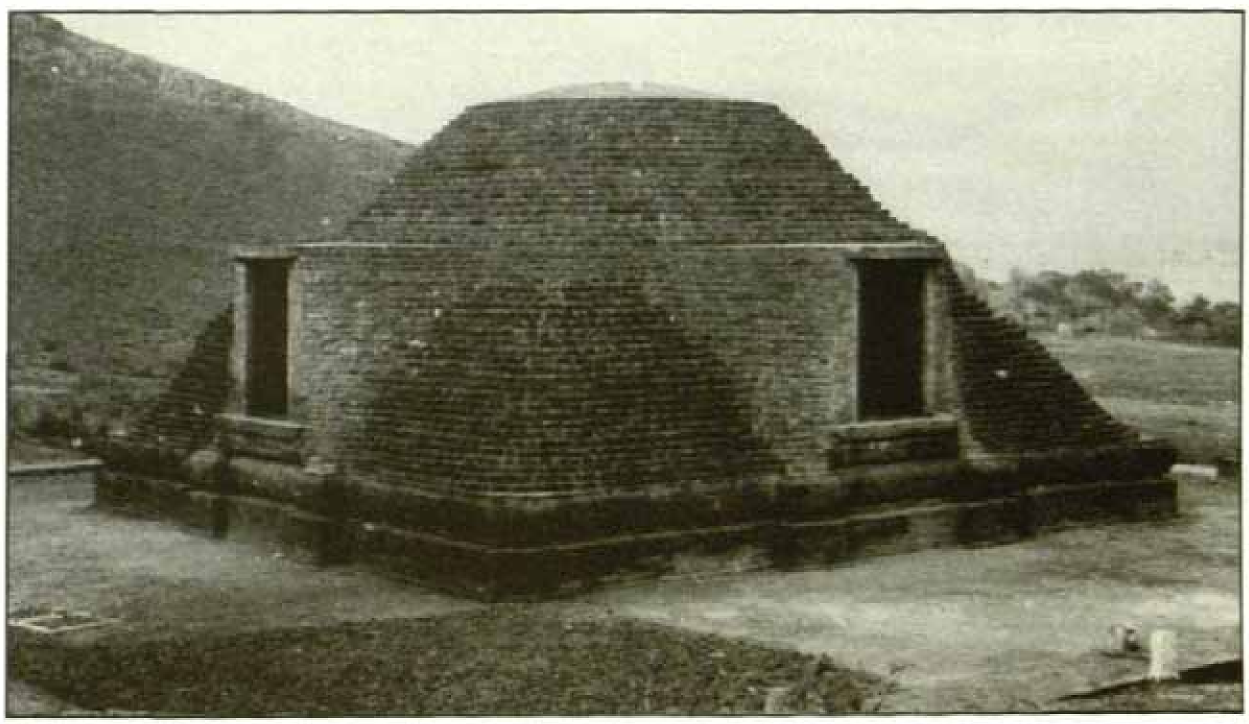
Satdhara : Stupa 8, A. *during and* B. *after conservation.* *See p. 163*



Satdhara : Stupa 1, before conservation. *See p. 163*

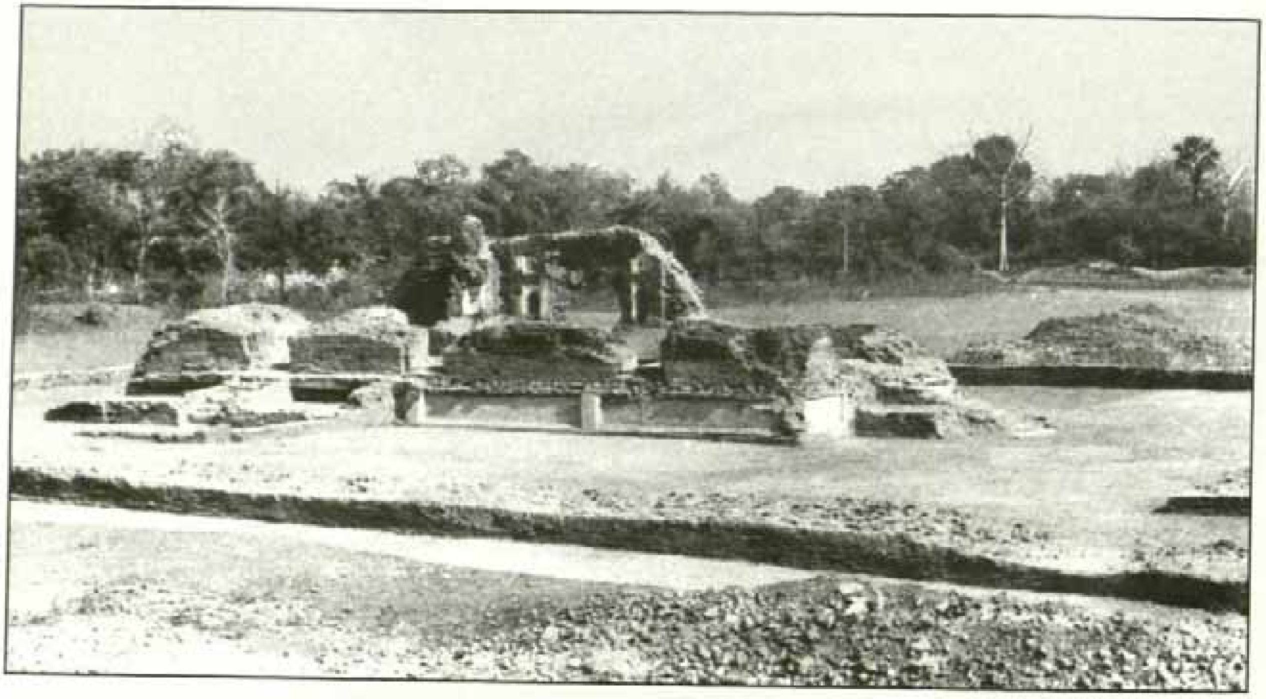


A

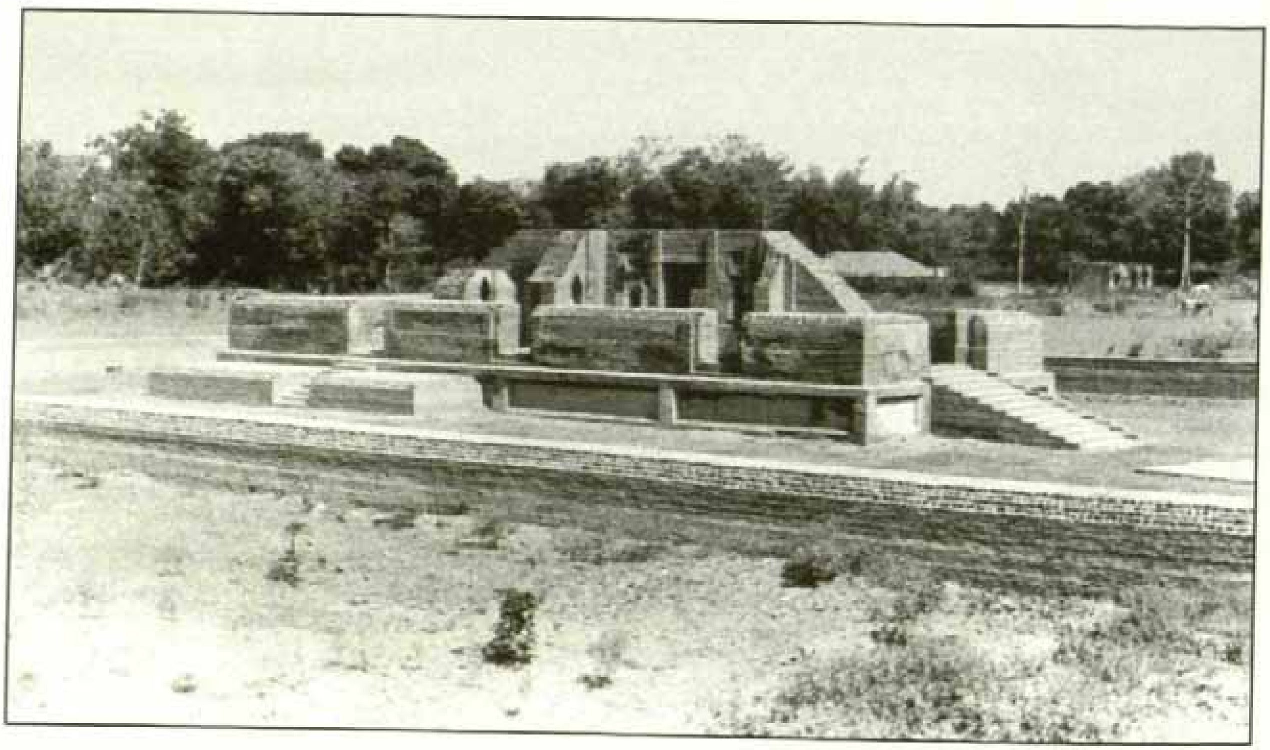


B

Udayagiri : exposed stupa, A, *during and* B, *after conservation.* *See p. 167*

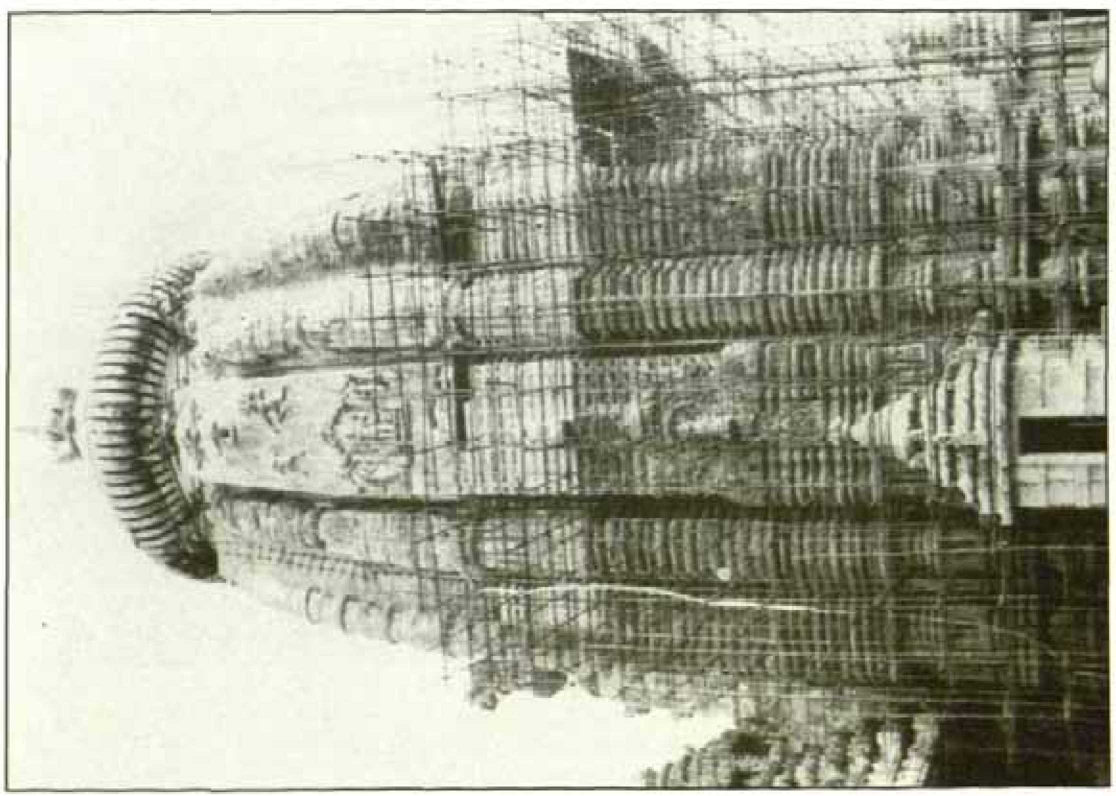


A

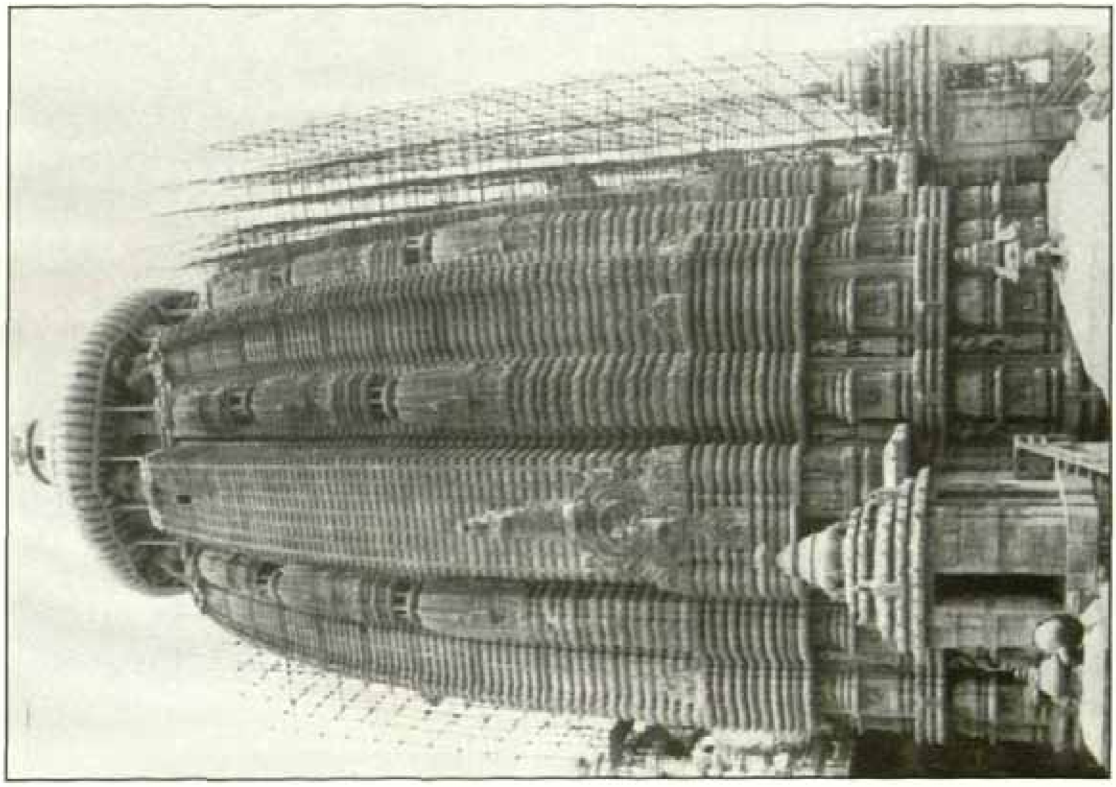


B

Haripurgarh : Radhamohana Brick-Temple, A, *before and* B, *after conservation. See p. 168*



A

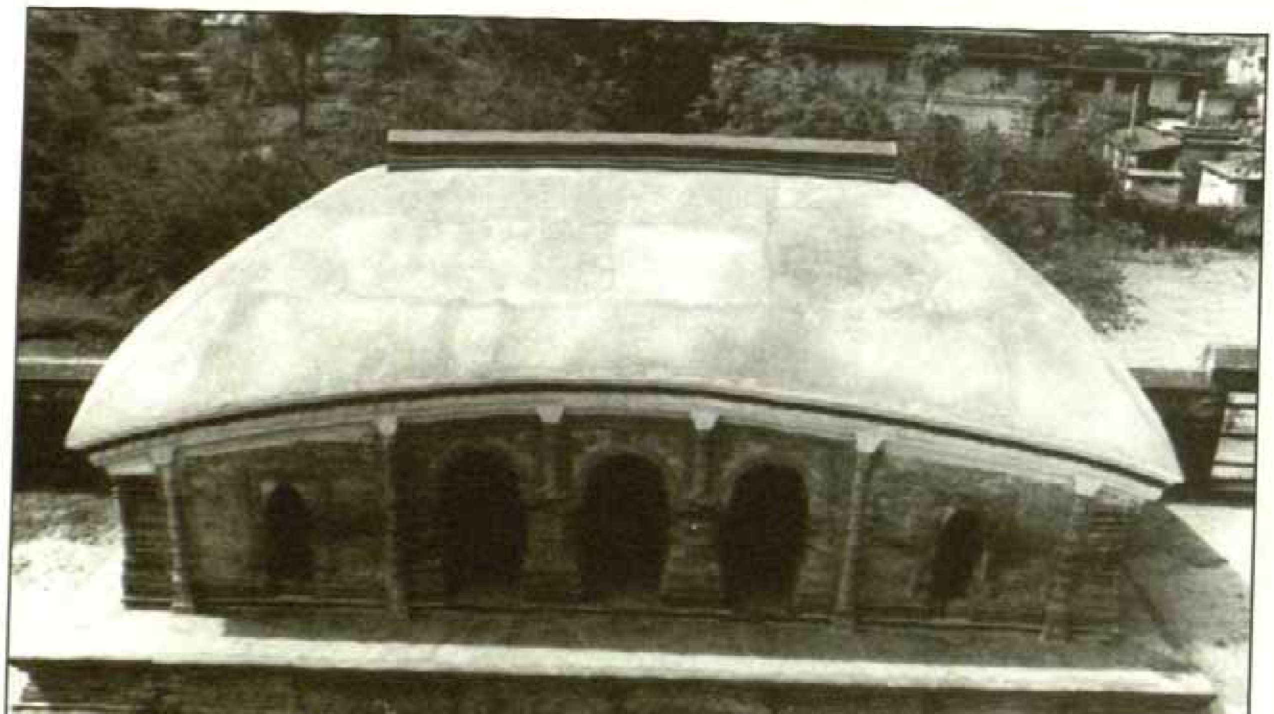


B

Puri : Jagannatha Temple, A, during and B, after deplastering. *See p. 168*

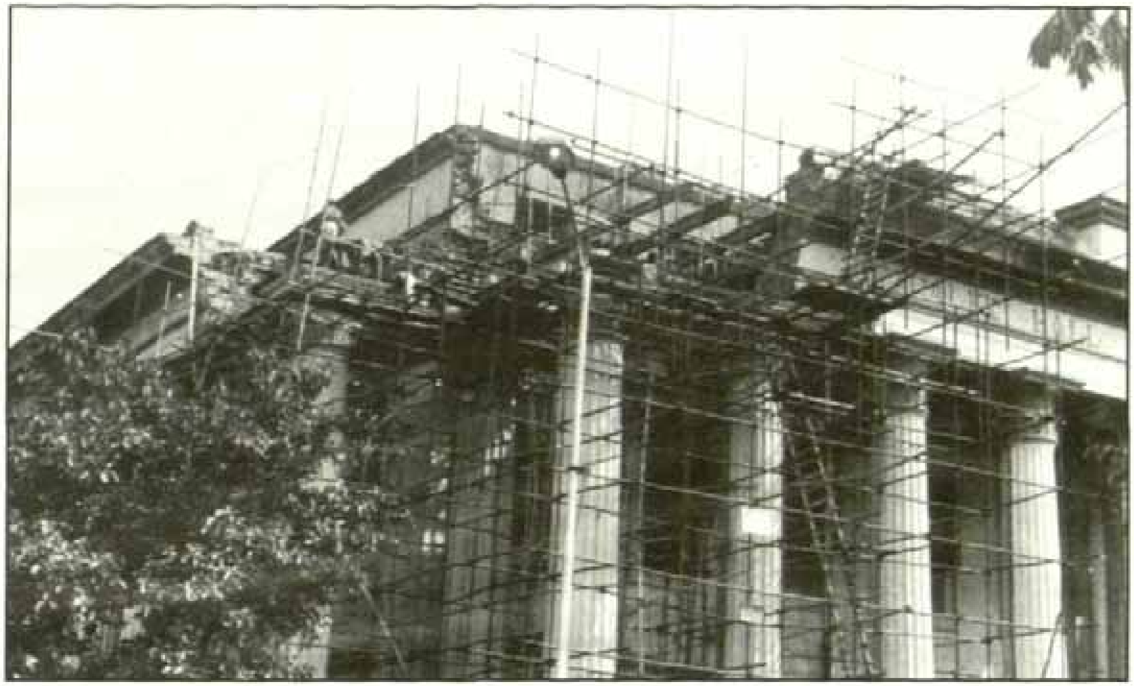


A



B

Bishnupur : Madanamohana Temple, A, *before and* B, *after conservation of mukha-mandapa. See p. 168*



A



B

Calcutta : Metcalfe Hall, A, *during and* B, *after conservation of the frontal portico.* *See p. 169*



A



B

Nirpalani : Siva Temple, A, before and B, after conservation of sikhara. *See p. 182*

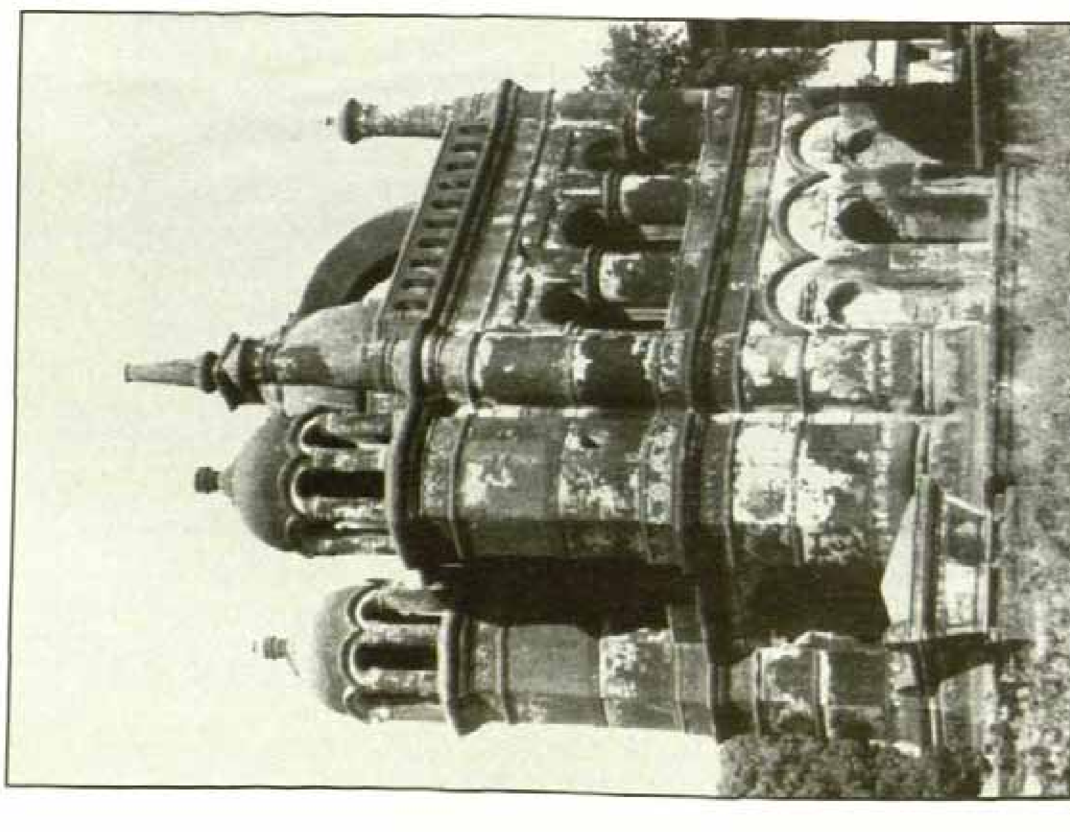


A

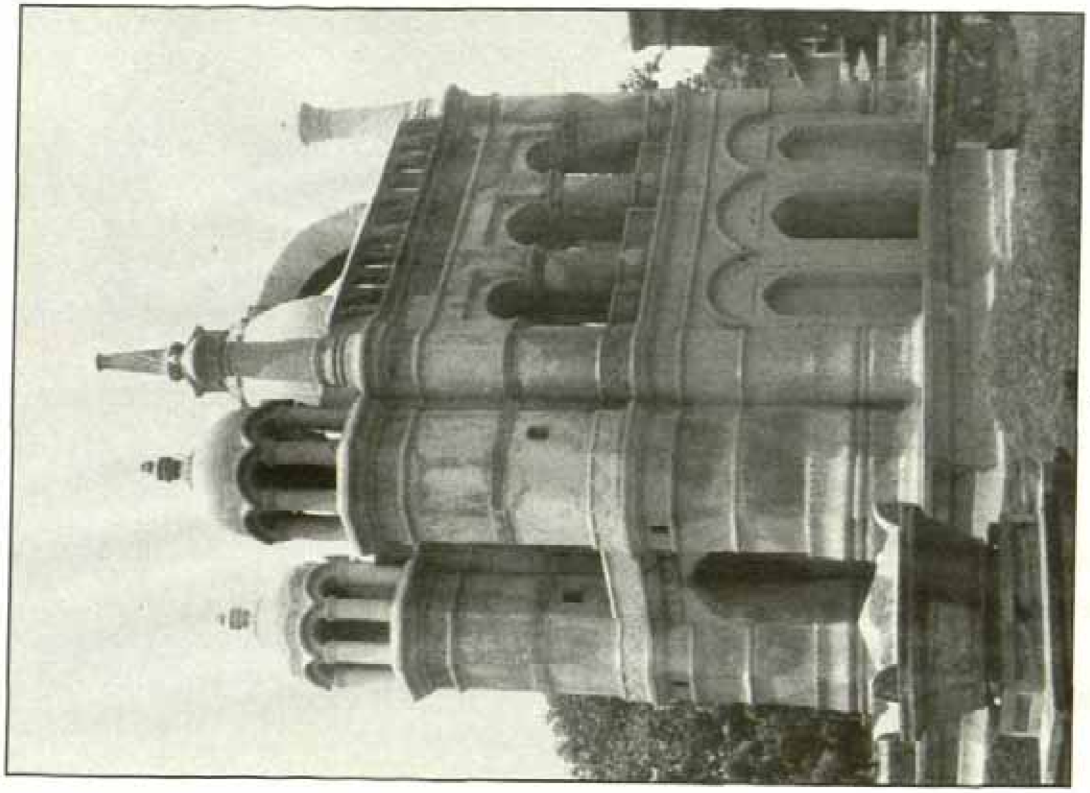


B

Vellanur : Kailasanatha Temple, A, *before and* B, *during conservation.* *See p. 182*

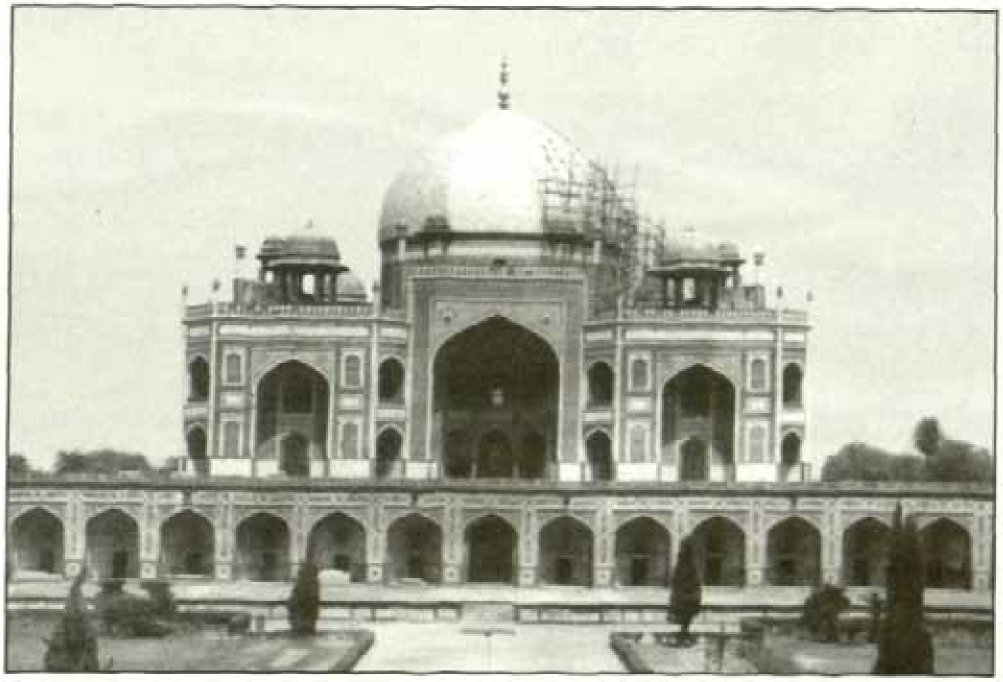


A

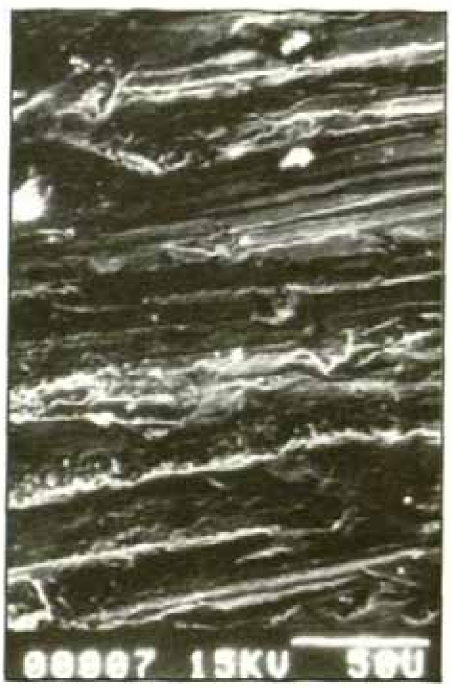


B

Surat : Old English Tomb, A, before and B, after conservation. *See p. 187*



A

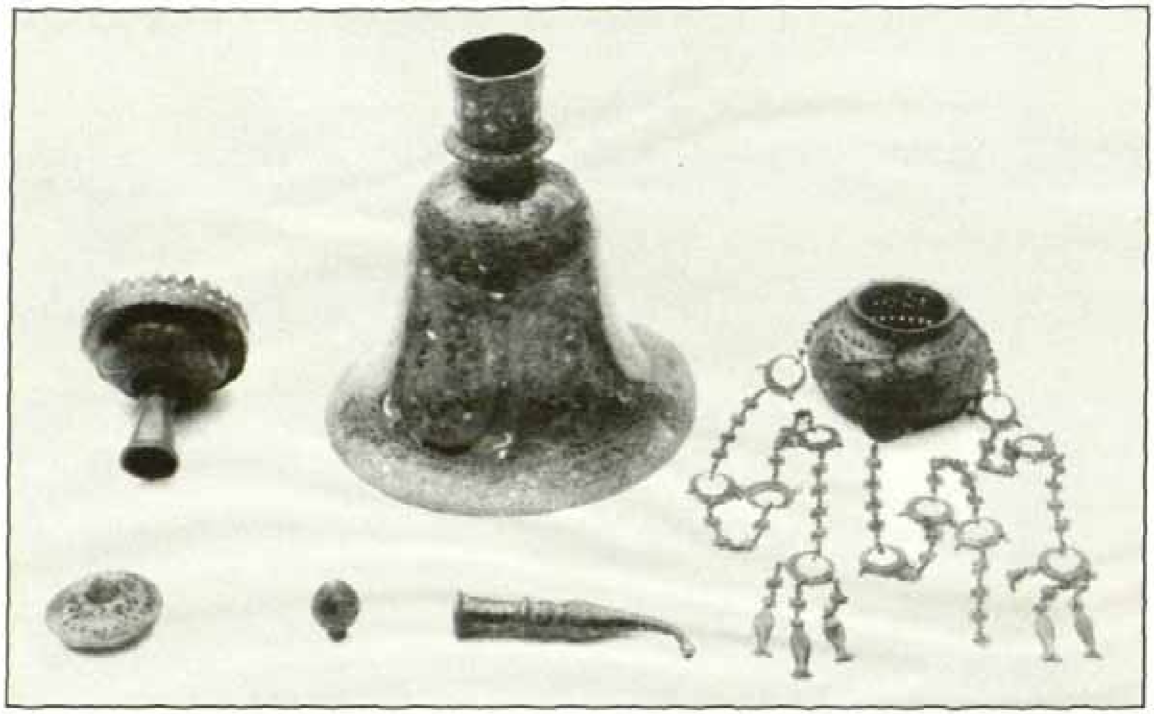


B

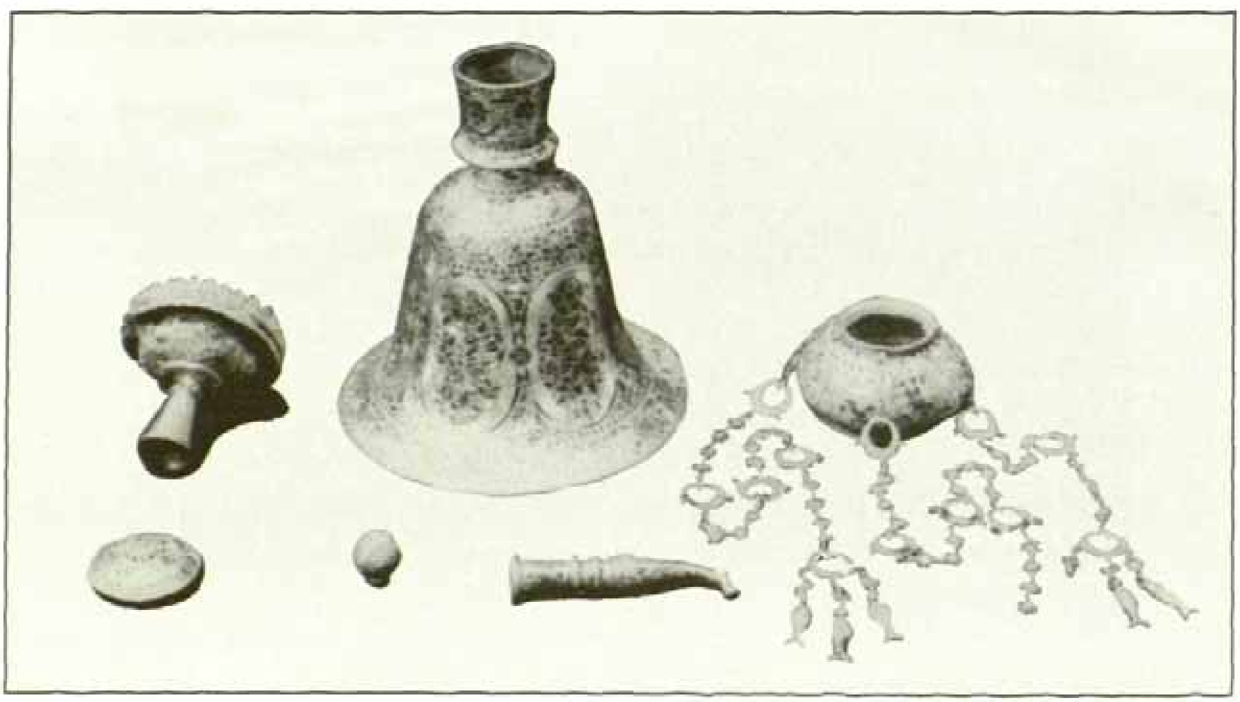


C

A. *Humayun's Tomb : during chemical conservation of main dome;* B. *Dhar : Iron Pillar, SEM micrograph showing fibrous structure of metal and distribution of elongated slag and* C. *SEM micrograph of iron sample indicating metallic inclusion distributed in ferritic and slag matrix. See pp. 190 and 206*



A



B

Red Fort : Swatantrata Sangrama Sangrahalaya, parts of hukka, A. before and B. after chemical treatment. See p. 204.



A



B

Red Fort : Swatantrata Sangrama Sangrahalaya, lithograph. A, before and B, after chemical treatment. *See p. 204*



A



B

Dhar : Iron pillar, microsoft iron sample. A, non-metallic inclusion distributed in the slag and B, cracked quartz grain surrounded and penetrated by glassy material under polorized illumination. See p. 206

ARCHAEOLOGICAL SURVEY OF INDIA